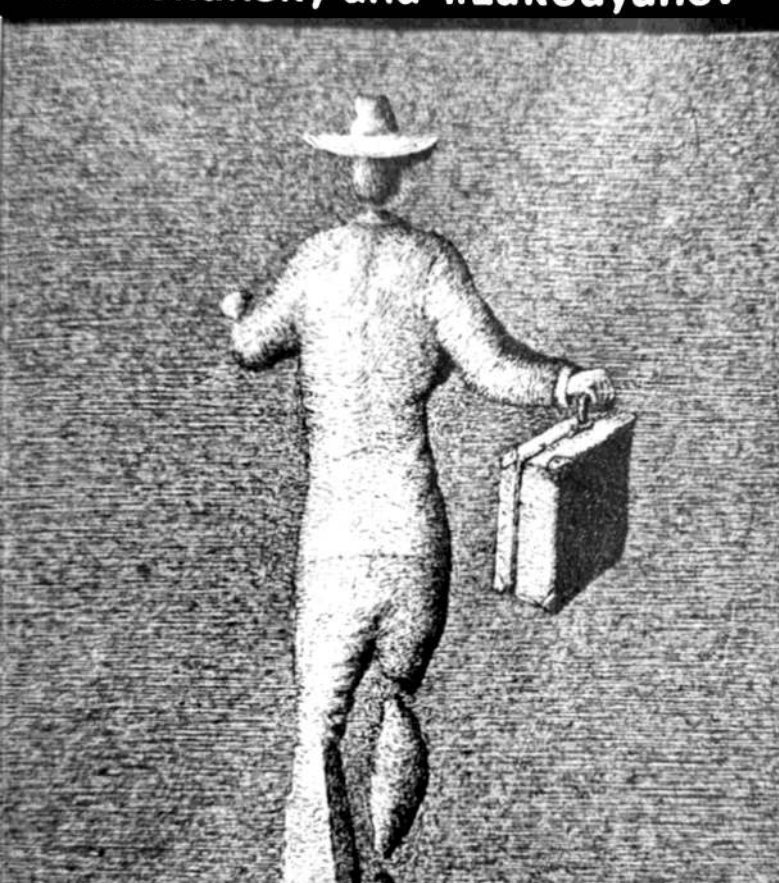
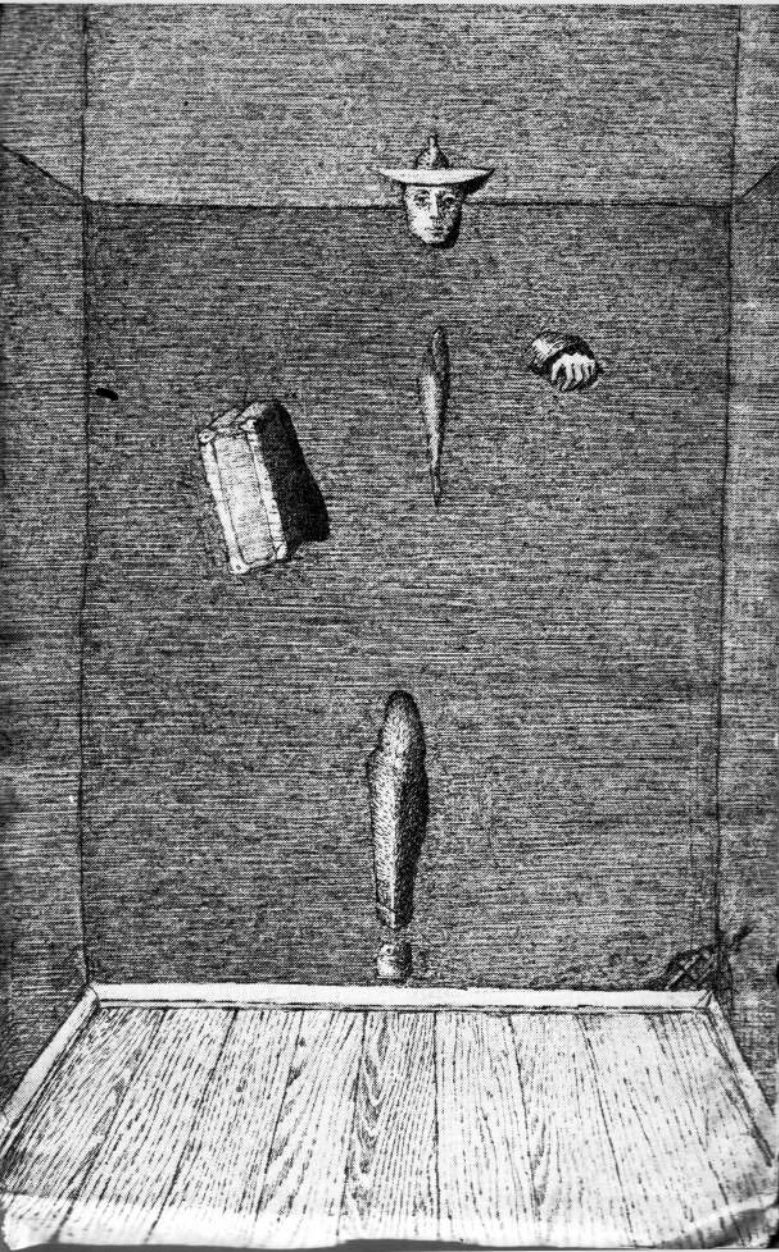
E. Voiskunsky and I. Lukodyanov



THE CREW OF THE *Mekong*



E.Voiskunsky and I.Lukodyanov

THE CREW OF THE *Mekong*

Being an account
of the latest fantastic
discoveries,
happenings of the
eighteenth century,
mysteries of Matter,
and adventures
on land and at sea

Mir Publishers Moscow

Е. Войскунский, И. Лукодьянов

ЭКИПАЖ «МЕКОНГА»

ИЗДАТЕЛЬСТВО «ДЕТСКАЯ ЛИТЕРАТУРА»

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I'll die if I don't see the Caspian.

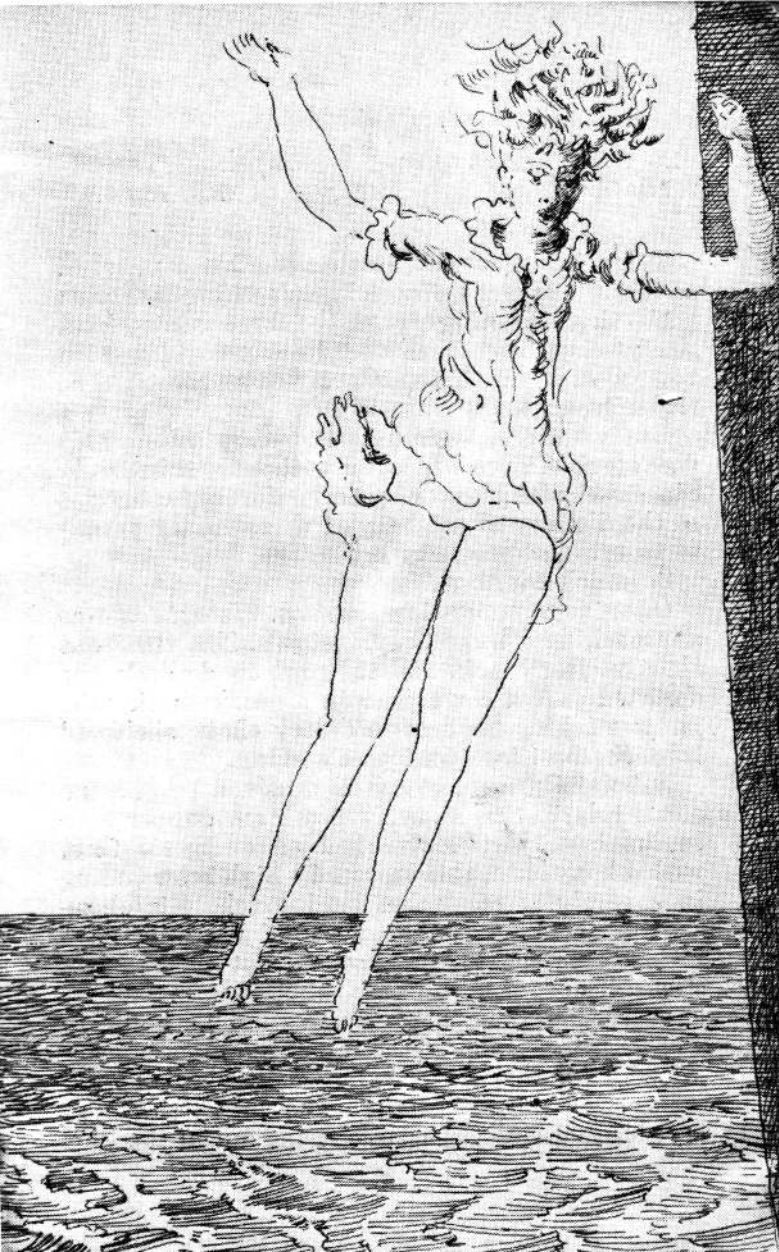
— ALEXANDER VON HUMBOLDT

1

THE MERCURY HEART

If you wish to subject an unknown substance to the action of an unknown force you must first study this substance.

Honoré de Balzac —LA PEAU DE CHAGRIN



CHAPTER ONE

IN WHICH A STRANGE OCCURRENCE TAKES PLACE ON BOARD THE M.S. *UZBEKISTAN*

There is a great temptation to start a novel of adventure with a shipwreck. Something like this:

"With a sickening crunch the three-masted bark *Aretusa*, sailing from the New Hebrides with a cargo of copra, listed heavily to starboard. The raging sea swept over—"

But we did not yield to the temptation. This true story of ours will open without a shipwreck. Since we wish, however, to conform throughout to the dictates of good style, we solemnly promise to arrange one later on.

So much for that.

One fine summer day the m.s. *Uzbekistan* was approaching a large Caspian town. The time was shortly after lunch, and the promenade deck was deserted except for a man in a green check suit. He was taking his ease in a deck chair, sheltered from the broiling sun by an awning.

Nikolai Opratin, a person destined to play no small role in this story, was a lean, dapper man in his late thirties. He had an energetic face, with a bony chin, thin lips and a high brow ending in a carefully concealed bald patch. His close-shaven cheeks and the aroma of his aftershave lotion created the impression that he had just stepped out of a barber's chair.

Postprandial naps were a pernicious habit in which Nikolai Opratin did not indulge. He reclined in his deck chair, gazing at the ship's broad, foamy wake. On his right he could see the greyish-yellow strip of coastline rising out of the blue

sea. The long hilly island at the entrance to the bay was already in sight.

The island had been much smaller twenty years ago, Opratin reflected. Through the centuries the level of the ancient Caspian had often risen and fallen, sometimes by as much as eighty metres. In recent years it had dropped greatly. Man, no longer willing to be just a passive observer, had now set himself the difficult task of raising the level of the Caspian. One of the ideas suggested was to seal off, with a dam, the Bay of Kara-Bogaz-Gol, where the hot desert sun evaporates fourteen cubic kilometres of Caspian water annually. Another was to divert northern rivers into the Caspian. Under this bold scheme, the Kama, Vychegda and Pechora rivers were to be pumped across the watersheds and made to flow southwards into the Volga, which empties into the Caspian Sea.

Even if Kara-Bogaz-Gol Bay were cut off from the sea, northern rivers diverted, and water from Central Asia's great Amu Darya river added, the level of the Caspian would not rise by the desired three metres before the year 2000.

That was far too long to wait. Actually, the addition of only one thousand cubic kilometres of water to the Caspian in the course of one year would do the trick.

But this was easier said than done. Several thousand giant pumps and a power station with a capacity of scores of millions of kilowatts would be required to shift that amount of water from the Black Sea, say, to the Caspian in one year.

Nikolai Opratin, Candidate of Science (Tech.), had all these figures at his fingertips because he was the man in charge of the key aspect of a Caspi-

an-level scheme at the Research Institute of Marine Physics.

Although the level of the Caspian had dropped, the sea was still more than deep enough for the *Uzbekistan*. The town came into view, rising slowly out of the blue bay. Smokestacks and the delicate tracery of TV aerials could be seen with the naked eye.

The decks now swarmed with passengers. Many were holiday-makers returning home from a cruise along the Volga.

A trio of sailing enthusiasts leaned on the rail as they discussed the merits of a white sailboat that was overtaking the ship.

Young men and women in blue jerseys with white numbers on their backs tirelessly took snapshots of one another.

A husky, well-built man in a striped shirt worn over his trousers strolled along the deck with his plump wife on his arm. From time to time he paused to give a young photographer some pointers about which aperture to set and which shutter speed to use.

"What a pity our holiday is coming to an end, Anatole," a woman somewhere behind Opratin remarked in a high-pitched voice.

"Thank goodness it's over—that's what I say," a man's voice replied. "Just think of all the time lost." The voice struck Opratin as familiar. He turned round to see a slender young blonde in a red sun-dress, and a middle-aged man in a crumpled pongee suit. The man had a broad, large-featured face, puffy eyelids and an unruly shock of brown hair.

The couple, deep in conversation, stopped by the rail not far from Opratin's deck chair.

Opratin rose, straightened his jacket, and walked over to them. "Good afternoon, Benedictov," he said in a low voice.

The man in the pongee suit stared at him coldly. "Ah, the expert who writes reviews," he remarked. He reeked of brandy.

"I saw you in the restaurant during lunch but didn't venture to impose on you," said Opratin. He turned to Benedictov's companion with a slight bow. "My name is Nikolai Opratin."

"How do you do," she replied. "I'm Rita Benedictov. I've heard about you."

Opratin lifted the corners of his mouth in a smile. "I don't doubt it. Nothing very flattering, I'll wager." His tone was half-questioning, half-affirmative. The young woman merely shrugged. With the sun on her face, her brown eyes were warm and clear, but there was a hint of melancholy in them.

"Were you on the Volga cruise too?" she asked.

"No, I came aboard last night at Derbent. Business. By the way, a curious thing happened to me in Derbent—"

A glance at Benedictov's face told Opratin that he couldn't care less about anything that had happened at Derbent.

"Tut-tut, he still holds a grudge against me," Opratin thought.

That spring a scientific journal had asked Nikolai Opratin to write a review of an article submitted for publication by a biophysicist named Anatole Benedictov. The article had impressed him. Benedictov began by analysing, in the light of modern physics, the phenomenon of ionophoresis, known since 1807 when Professor Reiss of Moscow discovered that drops of one liquid are

capable of moving through another liquid. Further, Benedictov gave an account of his observations of fish having electric organs and cited interesting information about them. The electric ray, *Torpedinidae*, for example, generates 300 volts at eight amperes, and the electric eel, *Electrophorus Electricus*, as much as 600 volts.

Benedictov maintained that such fish, Nature's largest living power generators, created an electric field the action of which makes water pass through their scales into their bodies. He had planted contacts in fish to measure differences in the action potential of the skin and the internal organs, and had concluded that under certain definite electrostatic conditions liquids penetrate through living tissue. Benedictov put forward the hypothesis that it would soon be possible to subject fish to special irradiation that would make them both penetrable and able to penetrate through solid matter when required. For example, fish would be able to pass freely through concrete dams on rivers.

In his review Opratin had spoken highly of the fish experiments but had politely ridiculed the penetrability hypothesis. The editor of the journal had introduced him to Benedictov. Benedictov had disagreed with Opratin's conclusions, called the review "narrow-minded", and refused to let his article be published.

All this had taken place about three and a half months earlier. Now the author and the reviewer were meeting for a second time.

"There was no need to take offence, Benedictov," Opratin said mildly. "Your article had a lot of interesting points, as I noted in my review—"

"I didn't take offence," Benedictov interrupted.

"It's just that I don't think you— hm, well, that you know much about bioelectricity."

Opratin took out his handkerchief and wiped his forehead. "Let's not argue about it," he said quietly. "You know more about some things and I know more about others. Isn't that so?"

"In that case, stick to what you know and don't go poking your nose—"

"Anatole, please," the woman said, putting her hand on her husband's arm.

"I shouldn't have spoken to him," Opratin thought. "He's all keyed up." Aloud he said: "I have no intention of interfering in your affairs. I hope you'll finally realize your hypothesis is groundless. Ionophoresis and reciprocal penetrability of bodies are immeasurably far apart. Goodbye."

Opratin made a dignified turn but before he had taken two steps Benedictov called to him. "Look here", he said. "Want a demonstration of penetrability?"

"Stop it, Anatole," said the woman. "Don't, I beg you."

Benedictov waved her aside. "Look!" He thrust his hand inside his shirt and drew out a knife.

Opratin took an involuntary step backwards.

The husky man in the striped shirt strode over to Benedictov. "Hey, none of that! Put that knife away."

Benedictov ignored him. "Here's penetrability for you!" he exclaimed. He pushed up his left sleeve and slashed his forearm with the knife.

Someone gave a stifled scream. A crowd started to gather.

"See that?" Now Benedictov plunged the knife into his arm. The narrow blade, on which a wavy

pattern was engraved, passed straight through his arm without even leaving a scratch on it.

The crowd was struck dumb. Benedictov laughed. As he was putting the knife away the husky man stepped towards him again.

"Give it here," he said. "I'll teach you to frighten people." He made a grab for the knife but his hand closed over emptiness.

"Keep out of this!" Benedictov shouted. But the man twisted Benedictov's arm, and the knife dropped to the deck, dangerously near the edge. Several hands reached for it.

The next instant a slim figure in a sleeveless red dress pushed forward through the crowd, ducked under the railing and dived down towards the water, six metres below.

"Man overboard!" someone shouted.

Life preservers plopped into the sea and lifeboat tackle began to creak. The ship started on a circle that would bring it back to the spot where the passenger had fallen overboard. But this turned out to be unnecessary. The white sailboat, then about a hundred metres from the ship, made a wild turn into the wind. Listing heavily, the boat raced towards the head bobbing among the waves.

As the crowd looked on, a tall, bronzed young man dived into the sea. A few minutes later the red sun-dress was to be seen on the deck of the sailboat.

The *Uzbekistan* approached the sailboat from the lee side.

"Any help needed?" the officer of the watch called out.

A woman's voice floated up. "No, thanks. They'll take me ashore."

The passengers excitedly discussed the rescue. Cameras were focussed on the sailboat. Anatole Benedictov, his face white as a sheet, stood apart from the crowd. He gripped the railing and stared down fixedly at the sea.

When Nikolai Opratin raised his head after looking in vain for the knife on deck his eyes met the intent gaze of the husky man.

"A tricky little knife," the man remarked. "A pity the fishes will get it."

Opratin turned away.

CHAPTER TWO

IN WHICH THE READER IS INVITED TO GO SAILING TOGETHER WITH THE MAIN CHARACTERS

Now let us turn back the clock a few hours and shift the scene to the bazaar in that large town on the Caspian Sea.

It was Sunday, and the bazaar was so thickly packed with people that it could have been described as a dense substance, all the constituent elements of which were in constant motion. Motivated by the law of supply and demand, buyers and sellers were attracted to one another like bodies possessing different electric charges. They moved towards one another, overcoming an opposing force, namely, different ideas about prices.

Two tall young men strode quickly towards the bazaar. The tow-headed, blue-eyed man, whose name was Yura Kostyukov and who wore a bright red short-sleeved shirt and sand-coloured trousers, glanced at his watch.

"It's a quarter to nine already. Val is probably waiting for us at the yacht club."

"Let her wait," his friend Nikolai Potapkin said. "The worst that can happen is she'll give you a tongue-lashing." Nikolai had a high forehead, prominent cheekbones and a shock of dark hair. His grey eyes were calm and somewhat quizzical. The rolled-up sleeves of his white shirt revealed a pair of hairy muscular forearms.

The two friends passed through an arched gateway and came out near a display of paintings, some of them executed on cardboard, some on oilcloth and some on polythene film. They were the kind of paintings you will see only at bazaars. Most of them were crude copies of well-known canvases. The two young men stopped in front of one of them which depicted a plump nude with pinkish-purple skin reclining on the bright blue surface of a pond beside a dazzlingly white swan.

"Just look at that," Yura remarked. "What a wealth of colour!"

"It's Leda and the swan, from Greek mythology," said Nikolai.

Yura laughed. "You mean that fat lady is Leda, the Spartan beauty? The mother of Helen of Troy and Clytemnestra? The mother-in-law of King Menelaus and King Agamemnon?"

"But look at how she's lying on the water," Nikolai said.

At that moment a man in his forties, wearing large, horn-rimmed eyeglasses, with greying hair, plump tanned cheeks and a small pot-belly, came up to them.

"Fie," he said in a low voice. "You ought to be ashamed of yourselves."

The two young men turned round. "Why, it's Boris!" Yura exclaimed.

"Fie," the plump man repeated. Boris Privalov was head of the department in which the two young men were employed as research engineers. "Staring at a nude!"

"No— I'm intrigued by the way she's floating on top of the water," Nikolai said. "You might think she was lying on a sofa."

Boris Privalov examined the pinkish-purple lady more closely. "H'm, yes, indeed. An extraordinary case of surface tension. But you didn't come here to buy a painting, did you?"

"Of course not. We're looking for a pulley-block for our stay-sail halyard," Yura explained. "We were at the marina, giving the boat a once-over, and we saw a block had to be replaced. We couldn't find anything suitable in the store-room there. Dockmaster Mehti said we were getting to be as finicky as pampered lap dogs. He said that if we didn't like the block he offered us we could trot down to the bazaar for one. So that's that. Are you looking for anything in particular?"

Before replying, Privalov glanced about. "No, just browsing, so to speak."

"Do you suppose it would be possible to build up surface tension artificially?" Nikolai asked.

"Build it up, you say?"

"Yes." Nikolai put a finger on the blue surface of the water in the painting. "So that a person could stretch out on the water, the way she's doing."

"But what for?"

Nikolai lifted his shoulders. "I don't know. It simply occurred to me."

"An interesting point," Privalov said after

a pause, during which he glanced about again. "But first you would have to examine the question of just what a surface is in general." He looked first at Nikolai, then at Yura, then began to talk. He loved to discuss scientific problems, and when some point caught his fancy he could talk about it for hours.

A cluster of people formed around them as first one passerby stopped to listen, then a second, then a third.

"Boris! Where've you disappeared to?" a woman's voice called.

Privalov stopped short. "I'm here, Olga," he said to a round-faced, thick-set woman who was pushing her way towards him through the crowd. "I ran into a couple of my men—"

"So I see." The woman glanced with distaste at the painting. "How could you stand here looking at that abomination?"

"Good morning," said Yura, an earnest smile on his face. "You see, it's really our fault—"

"How do you do," the woman replied. "Come, Boris. I've found a hand-chased copper jug for your collection—if someone hasn't snatched it up already."

Privalov nodded to the two young men and followed his wife. But after a few steps he halted and squatted to examine a pile of metal junk.

"Here's the block you're looking for, boys," he called.

Nikolai came over to him, picked up the block and examined it. "It'll do," he said.

"Boris!" Privalov's wife called.

"Just a moment." Still squatting on his haunches, Privalov pushed his glasses up onto his forehead and studied a small bar of rusty iron

that he had picked up. He tapped it with a forefinger.

Nikolai paid for the block. With a wave of his hand the owner of the pile of junk threw in the bar of rusty iron for the same price. Privalov wrapped it in a page from a newspaper and put it in his pocket.

"What do you want the piece of iron for?" Yura asked.

"Oh, it just caught my eye. Well, so long, Siamese twins."

"We're thinking of going out in the boat to take a look at the site," said Nikolai, lowering his voice.

Privalov's face brightened. "That's a good idea, a wonderful idea, in fact. I was just— Wait a moment—"

He stepped over to his wife and whispered something to her.

"Of course not!" she exclaimed. "What talk can there be about the pipeline? Today's Sunday and everybody's off."

"Sunday is a working day on the project because the power supply is better than on weekdays."

"But you wanted to look for some old copper wares, Boris."

"I'll get along meanwhile," Privalov said firmly. "Now don't fret, Olga. I'm sorry but I must go. I'll be back for dinner."

With a sigh, Olga gazed reproachfully at her husband's back.

Privalov and his young companions left the bazaar, took a trolleybus and in fifteen minutes reached the marina.

A dark-haired girl in a white blouse and gay-coloured skirt was sitting on the edge of the pier

dangling her tanned legs above the water and reading a book. When Yura caught sight of the girl he hastened out along the pier towards her.

"Hallo there, Val!" he called.

The girl slammed her book shut and sprang to her feet.

"You ought to be ashamed of yourself!" She snatched off her sunglasses to glare at Yura. "We made a date for eight o'clock and now it's going on for ten."

"We had an urgent job to do for Mehti," Yura explained. "Val, I want you to meet Boris Privalov."

Privalov held out his hand. "It's a pleasure," he said. "I've spoken with you on the phone. You're the girl who rings up Yura, aren't you?"

Val smiled. "Why, yes. But maybe I'm not the only one."

"Of course you're not," Nikolai put in. "Half of the girls in town ring him up."

"Can I help it if I'm popular?" Yura asked plaintively.

Val gave a giggle and pinched his arm.

They went aboard a sailboat that was tied up at the pier. It had the name *Mekong* on its bows.

Why was this Caspian boat named after that great river, 4,500 kilometres long, which flows through China, Burma, Laos, Thailand, Cambodia and Vietnam?

Well, sailing enthusiasts prefer lyrical names like *Orion* and *Sputnik* to the old-fashioned *Swift* or *Hurricane*. The man formerly in charge of this white sailboat had taken a liking to the Greek word *meconium*, which conjured up some sort of mythological picture in his mind. But

as soon as he painted this name on the bows he found himself the butt of curious jokes and innuendoes. Looking up the word, he learned that it was indeed Greek, but had nothing to do with mythology at all. He never showed up at the marina again.

The boat was turned over to Nikolai and Yura. Instead of racking their brains for a totally new name they simply changed *Meconium* into *Mekong*.

The stay-sail halyard block was quickly replaced by the new one. Soon after, the *Mekong*, heeling to starboard, was sweeping across the bay towards the sea.

"Haul the sheets home!" commanded Nikolai, who was the skipper. Privalov had crewed for them for more than a year but he much preferred to spend his weekends at home on the sofa with a book. He did not turn up at the marina very often, although he liked sailing.

After making fast the stay-sail sheet Privalov stretched out on the hot boards of the deck. How wonderful it was to lie there not thinking about anything, feeling the sun warm your bare back, watching the city with its hustle and bustle recede into the distance, and listen to the chatter and laughter of the two young men and the girl!

How wonderful it would be not to think about anything! But the pipeline kept intruding.

Quite some time had already passed since a bold project for laying an underwater pipeline between the mainland and the Neftianiye Reefs, a famous oilfield in the Caspian Sea, had been developed at Privalov's Oil Transportation Research Institute. It was an ingenious scheme that involved winding forty kilometres of pipes onto a gigantic wheel lying in the water just off the shore and

then gradually unwinding the line and towing it to the Neftianiye Reefs. Meanwhile the oil extracted there was being shipped out in tankers.

Privalov's plan had been approved, although many people thought it too risky.

During the past week the pressure of affairs at the Institute had prevented Privalov from visiting the pipeline site. Running into Yura and Nikolai at the bazaar had been a piece of luck for him.

A gentle northerly breeze carried the boat smoothly seawards. As he lay on his chest at the edge of the deck, Privalov reflectively observed the two resilient bow-waves formed by the boat. The *Mekong* seemed to be folding the water apart rather than cutting through it.

The water was resisting. Surface tension.

Privalov raised himself on his elbows and looked at Nikolai seated at the tiller.

"Now listen," he said. "If strong enough, the surface tension of a liquid could replace a pipe."

"I don't get it, Boris," said Nikolai.

Yura, sitting on the other side with Val, moved his head, tightly bound in a red kerchief, from under the stay-sail and stared inquisitively at Privalov.

"You don't get it?" Privalov reached over to his trousers, brought out his cigarette case and lit up. "Take an underwater pipeline. The oil is separated from the sea by the wall of the pipe. If we could make its surface tension strong enough, oil would flow in a separate stream, its own surface tension acting as a sort of film, or casing, and then you wouldn't need a pipe. See?"

"That's fabulous!" Nikolai exclaimed. "A pipeless pipeline! But how could you increase the tension?"

Privalov lay back. "It's all out of this world," he said, screwing up his eyes against the sun.

"Out of this world?"

"Well, yes. Surfaces have specific properties that no one is able to control. Forget it. The whole thing's just a daydream."

Privalov fell silent. He did not utter another word until their destination came into sight.

The sailboat rounded the yellow tongue of the cape and headed for shore. They had to drop anchor about a hundred metres from the beach because the bay was too shallow for them to proceed any further. Privalov shaded his eyes with his hand and studied the structures on the beach. They were surrounded by barbed wire.

"Might think we were in a desert," he muttered. "I had a feeling there's something wrong. Well, let's take a swim and go back home."

It was mid-afternoon by the time they lifted anchor and set out on the return trip. Nikolai lay on the deck beside Privalov, his hand on the stay-sail sheet, watching a big white passenger ship overtake them. Yura was now at the tiller. Val was perched beside him.

"Yura," she whispered. "Do you know if Nick has a girl friend?"

"Why don't you ask him yourself?"

Val laughed. "Oh, I couldn't. I'm afraid of him." After a pause she said, "You know my friend Zina, don't you? Let's introduce her to him."

"Better not," said Yura. "He's very choosy."

Val frowned. "Humph!" she said with a pout.

Yura struck up a song and Nikolai joined in. Sometimes they thought up their own words to popular songs, and sometimes they set poems to well-known tunes.

Meanwhile, the ship had drawn abreast of the sailboat. "Look at the crowd on deck," Nikolai remarked. "Some sort of a brawl, judging by the way they're milling about."

At that instant a slim figure in red plunged over the side of the ship.

"Veer!" Nikolai shouted.

Yura leaned on the tiller. The blocks creaked and the mainsail described a wide arc as it swung over to the other side. The boat, listing heavily to starboard, sped towards the ship.

"Take it, Val! Brace yourself with your feet!" Nikolai gave the girl the stay-sail sheet and dived into the water.

CHAPTER THREE

IN WHICH OPRATIN TELLS PRIVALOV SOMETHING AND LEARNS SOMETHING IN PASSING

Towards the end of the day Privalov's old friend Pavel Koltukhov, the Institute's chief engineer, dropped in to see him.

"Looks like smooth sailing at last, Boris," he said, sitting down and stretching out his legs. "Work will be resumed at the site tomorrow."

"Thank goodness!" Privalov flung himself back in his chair. "Those self-styled efficiency experts! To claim that it's cheaper to transport oil by tanker than by pipeline! But they forgot that tankers return empty. They close their eyes to the cost of taking on ballast water and then discharging it. To say nothing of the number of stormy days on the Caspian."

Koltukhov nodded his bald head in agreement. Then he stuck a cigarette between his lips and

gave Privalov a sharp glance from beneath beetling eyebrows.

"You don't have to persuade me a pipeline is better," he said. He walked over to a big map of the Caspian hanging on the wall.

"Forty kilometres of pipeline," he said. "Three more parallel pipelines will make it a total of 160 kilometres. A pipeline across the whole of the Caspian will add another 300 kilometres. We'll be paving the floor of the Caspian with steel."

"We'll be paving it with millions of roubles too," Privalov added, joining Koltukhov in front of the map. "Here we are in the twentieth century and the only way we know of transporting liquids is through pipes, just like in the first century."

Koltukhov chewed his lip. "Have you read Arshavin's latest article?" he asked.

"About towing oil across the sea in containers made of thin polythene film? Yes, I've read it."

"Not a bad idea," Koltukhov remarked. "It's been picked up abroad. So don't say we don't know how to transport liquid goods."

"There's an idea that keeps preying on my mind," said Privalov. "It concerns the physics of surfaces. All surfaces possess energy, don't they? Suppose we found a way of using this energy to alter the properties of surface tension. I mean, building up surface tension to such a degree that a stream of oil would be contained in a 'skin' of its own surface."

"Where'd you get that idea?"

"At the bazaar." Privalov told Koltukhov the gist of his talk with the two young engineers.

"Why, I see you're just an old day-dreamer." Koltukhov gave a short laugh. "You'll lead those

young men of yours astray. I'd advise you not to read Jules Verne the last thing before going to sleep."

"Oh, all right, all right."

"You're too long in the tooth for that sort of thing, Boris."

"What's age got to do with it? I read what I like, and I like Jules Verne. He's refreshing."

The telephone rang. Privalov lifted the receiver. "Yes? How do you do. Certainly you may." He put down the receiver. "Opratin from Marine Physics is dropping in."

"Oh, our old acquaintance. Do you see much of him?"

"No, not really. I'm better acquainted with the surveyors from that outfit. They're helping us to lay out the route."

Koltukhov glanced out of the window at the building of the Marine Physics Institute on the other side of the street. He watched a lean man in a straw hat step out of the front door and stride quickly across the street.

"Our neighbour's in a hurry," he remarked. "They say he's efficient. I'll wager he hasn't read Jules Verne since he was a boy."

A few minutes later there was a knock on the door. "Come in," Privalov said.

Opratin opened the door and, removing his hat, stepped into the room.

He smoothed down his thinning hair. "How have you been keeping?" he asked Koltukhov. "Haven't seen you for some time. How are things?"

"Not so bad." When talking with visitors Koltukhov liked to give the impression that he was just a "plain, down-to-earth Voronezh peasant", as he put it. And he really did come

from Voronezh peasant stock. "I spend my time making the rounds and giving advice."

"Still dabbling in resins and plastics"?

"We executives don't have much time for anything except organizational matters," Koltukhov said with an apologetic note. "But I do have a cubbyhole of my own, with mixers, thermostats and a press. Whenever I see a couple of young men engaged in idle conversation in the corridor I punish them by recruiting them to help me make a couple of plastic models. Besides, you know, those resins have an awful smell." After a slight pause he said, "I hear you had quite an adventure."

Opratin chose to be noncommittal. "Really?"

"Your director told me you fell into a pit in Derbent while on a business trip and had to prolong your stay there."

A shadow flitted across Opratin's face. "Yes," he said, "I did run into a bit of unpleasantness."

Koltukhov glanced at his watch. "Well, I'll leave you two together now. It's time I was off."

He nodded to the two men and walked unhurriedly to the door.

The name of the old Caspian town of Derbent means "Iron Gates". The town once guarded the narrowest place on a caravan route running between the mountains and the sea. Nikolai Opratin had been sent there to examine the ruins of fortress walls in order to obtain more precise information about the level of the Caspian in ancient times.

On his last day in Derbent Opratin wandered into an old stone quarry on the deserted shore. While clambering about the quarry he caught

his foot in a fissure. Suddenly the rocks gave way. His heart missed a beat as he felt himself falling into nothingness. He landed with a splash in a pool of mud about a dozen feet below.

He picked himself up and paused to catch his breath. Just a moment ago, a hot blue sky had stretched above him; now he was surrounded by musty semi-darkness. He took out his flashlight and swept its beam to right and left. He saw damp, moss-covered walls.

This prompted the thought that he had probably fallen into the underground passage that had once connected the Naryn Kale Fortress with the sea. The passage was mentioned in legends but so far no one had been able to find it.

The flashlight beam moved downwards. Opratin was a self-possessed man, but the sight of a human skeleton filled him with horror. He turned to flee and stumbled into a pool of cold water. This brought him to his senses. Besides, whom was he fleeing from?

He returned to the skeleton, to which the remnants of clothing still clung. The poor devil must have fallen into the passage and been crushed by rocks. Opratin's flashlight picked out a half-rotten sack. He gave the sack a push with his shoe. A gun fell out of it.

"It's a German pistol, a Luger," Opratin said to himself. "How odd!"

Poking through the contents of the sack he found a portable radio transmitter, several sticks of dynamite and some cartridges covered with green mould.

He turned his flashlight back on the skeleton. Something sparkled in the neck of the torn shirt. Bending down to take a closer look, he saw a

shiny metal chain on which hung a small crucifix and a flat rectangle of iron with letters on it. Opratin wiped the iron rectangle with a corner of the sack and read:

A M D G

Below these were smaller letters.

Only a Catholic would wear a crucifix round his neck, Opratin reflected. How long had the man lain there? Then suddenly he came out of his reverie. He certainly had no intention of becoming a corpse to keep the skeleton company. He picked up the pistol, saw that it was in working order, and fired at the spot of blue sky above his head.

Minutes passed, minutes that seemed hours to Opratin. He fired again. The passage rumbled like an active volcano, but no sound came from above.

Opratin fired again and again until all the cartridges were gone. Breathing heavily, he leaned against the damp wall. Despair swept over him.

Suddenly he heard alarmed voices overhead. He shouted. Choking from the stench of the passage and the smell of gunpowder, he shouted until he was hoarse. The faint light from above was blotted out by a head that appeared in the opening.

"Who fired those shots?" a voice demanded from above.

A few minutes later a rope was lowered through the hole and Opratin was hauled out.

Opratin had to postpone his departure while he answered questions put by the local authorities and set forth the whole matter in writing. That was a nuisance, for Opratin hated to waste time.

Nikolai and Yura sat side by side at a desk, bent over a blueprint of the pipeline route. They were checking the figures indicating the depths.

Valery Gorbachevsky, a young lab technician, glanced at his watch, then walked over to the mirror and smoothed down his black sideburns and moustache, meanwhile singing a song about a lad named Chico who came from Puerto Rico.

"My dear Valery," said Yura, "do you know where Puerto Rico is?"

The lab technician shrugged a shoulder. "Of course. You don't doubt it, do you?"

"Not very far from Madagascar, isn't it?"

"Well, yes, you could put it like that," Valery said hesitatingly.

"Now you see, my friend, how disastrous it is—" Just then the telephone rang, and Yura broke off to pick up the receiver.

"The chief wants you, Nikolai. With the route plan."

Nikolai went up to the next floor, taking the steps two at a time, and entered Privalov's office. Privalov had a visitor, a man in a green suit, whom Nikolai had never seen before. The visitor gave Nikolai a keen glance, nodded and said, "My name's Nikolai Opratin."

Nikolai introduced himself and sat down.

"Nikolai Opratin comes from the Institute of Marine Physics across the street," Privalov said to Nikolai. "He has given me some interesting information which we will have to take into account. Yes, indeed." Here Privalov pushed his glasses up onto his forehead and bent over the plan of the pipeline route. "Now take this shoal that's to be deepened by blasting."

Opratin crossed his legs. "That won't be necessary," he said with a glance at Nikolai. "I've just told your chief the level of the Caspian will rise in three years' time. That means there isn't any need to deepen the route."

"Is your information reliable?"

Opratin smiled. "The most reliable there is."

Privalov leaned back in his chair. His glasses slid down to the tip of his nose.

"Well, we'll just have to revise our calculations," he said, rubbing his forehead. "I'd like you to step over to the Institute of Marine Physics tomorrow, Nikolai. Will that be all right?" he asked, turning to Opratin.

"Certainly. After lunch, preferably."

"Fine. You can't imagine how much worry this pipeline is causing us. Doubting Thomases are holding up the work. We visited the site last Sunday and—oh, well, you understand."

Opratin nodded sympathetically. "Yes, I do. By the way, I didn't know you went in for sailing."

"Indeed?"

"I saw you in a sailboat last Sunday."

"Where were you?"

"Aboard the *Uzbekistan*."

"Well, well. Why did you drop a lady overboard?"

Opratin's thin lips spread in a faint smile.

"It wasn't me who dropped her," he said. "There was some sort of row on deck. I don't know whether she was pushed overboard or just fell in. It seemed to me she was holding some metal object in her hand."

"A metal object?" Privalov glanced at Nikolai. "Did you see anything like that when you fished her out of the sea?"

"The only metal I saw was the buckles of her sandals."

Opratin rose. "Anyway, there was something else about that particular spot besides the rescue of the lady. I saw bubbles rising to the surface. Could have been natural gas, couldn't it?"

"It could. You ought to inform the gas experts."

"How can I if I don't know the exact spot? It's not like on shore, where you have landmarks."

"If I remember rightly, the TV tower was straight ahead of us at that moment," said Nikolai. "The refrigeration plant was at right angles to it. The No. 18 buoy in the channel was about a hundred metres to the north. Those points should be enough to find it, I think."

"Thank you," said Opratin. "I'll be expecting you tomorrow." He said goodbye and left.

CHAPTER FOUR

ABOUT A DROP THAT WAS DROP-SHAPED

They left the Institute together and walked down the street in the bright sunshine.

"Why do you think she fell overboard, Yura?" Nikolai asked.

Yura grinned. "Beware of women who fall overboard. I shouldn't rescue them if I were you."

"Oh, shut up," Nikolai growled, and quickened his steps.

The woman in the red sun-dress was not exactly preying on his mind, but there was something about her narrow, dark-eyed face, framed in fair hair, that vaguely disturbed him. He had a feeling he had seen that face somewhere before.

She was, of course, an unusual woman. She had

not shown a trace of fear in the sea. When he swam over to her she had said, "No need to rescue me. I'm a good swimmer." By that time the sailboat was beside them. Yura had heeled into the wind so sharply that the starboard side was level with the water and Nikolai did not even have to help the woman climb into the boat. She thanked them politely, her gaze on a point somewhere between Privalov and the mast, wrung out her dripping hair and then went down into the cabin. Val came out of the cabin with the red sun-dress and hung it up to dry in the sun.

When the boat reached the marina the woman sprang gracefully onto the pier. "Please don't trouble yourselves," she said. "I'll get home all right without any help." Her red dress flashed among the trees on the seaside promenade and vanished. That was the last they saw of her.

The two men turned off the bustling avenue into quiet Cooper Lane.

"Will you come in for a while?" Nikolai asked, stopping under an archway that led into a courtyard.

"Can you lend me something to read?"

"Of course I can."

They crossed the yard diagonally. It was a yard they had known from childhood, with a glassed-in gallery running the length of the two-storey house. An outside stairway supported by iron posts, down which it had been so convenient and pleasant to slide, led up to the top floor. In the cellar the children used to hunt for buried treasure and hide from pursuit, sending arrows flying through the air.

Yura and Nikolai had grown up in this wonderful courtyard which could be turned, in the twinkl-

ing of an eye, into a prairie or the deck of a frigate. Here they had invented their earliest games and read their first books. They had raced about the yard, shooting arrows from their bows and lassoing the rubber plants set out for watering.

One of the ground-floor tenants in those days was a sailor. The boys used to gaze respectfully at his black cap with its gold emblem and the gold stripes on his sleeve. The sailor would be away for weeks at a time, leaving behind, at home, a live turtle and a daughter with freckles and yellow braids.

Although girls were not invited to play Red Indians, Yura and Nikolai made an exception in the case of the sailor's daughter. Yellow Lynx, as they named her, could run like the wind and slide down the stairway posts like a cat. She did not cry when they pulled her by her braids. She plunged courageously into courtyard battles, using her fingernails and screaming in a high, piercing voice.

Besides the live turtle there were other interesting things in the sailor's flat. A real dirk hung on one wall and a barometer on another. On the desk, beside a bronze inkwell, lay two pieces of iron with mysterious letters carved on them. Yellow Lynx and the boys resolved that some day they would discover the meaning of those mysterious letters.

The sailor and his daughter left for Leningrad early in the spring of 1941. Nikolai copied a picture from a volume of Pushkin's Tales showing a ship with a huge taut sail decorated with a drawing of the sun, approaching a wharf on which men in old-fashioned long robes were firing cannons. He presented it to Yellow Lynx as a fare-

well gift. They were both about nine years old at the time.

Soon after, a husky young man by the name of Bugrov, whom the boys addressed as Uncle Vova, moved into the sailor's flat. He had a blue motorcycle on which he sometimes took the boys riding. What is more, he taught them the Greco-Roman style of wrestling. A circus poster on the wall of the new tenant's room showed him among the other performers, very handsome and muscular in black tights, his chest bulging.

When the war broke out Uncle Vova locked up his flat and went into the army. Nikolai's father, who worked at a railway-carriage repair shop, was also drafted. Yura's father, an oil refinery engineer, was given a draft deferment.

Now the boys played army scouts and guerrillas. Life was hard, especially for Nikolai and his mother, who was a nurse and worked day and night at an army hospital.

Nikolai's father was killed in a battle on the Dnieper River.

After seven years of schooling Nikolai told his mother that he wanted to go to work. She tried to persuade him to stay in school but he would not be moved. Yura's father found a job for Nikolai as an apprentice fitter in the oil refinery's maintenance shop and persuaded him to attend night school.

Soon after, Yura's family moved to another part of town and Nikolai was left without a playmate. But this did not matter because he had no time for play.

Yura felt that fate had been unkind to him for making him sit over his books all through the war instead of letting him fight the nazis. Besides,

he envied Nikolai's hands, with their traces of grease and metallic dust. And so, after finishing the eighth grade at school Yura went to work in the maintenance shop, side by side with Nikolai. They went through night school together and then entered the evening department of a college.

Shortly after graduating with degrees in engineering the two young men were assigned to jobs in the Oil Transportation Research Institute, where they worked under Boris Privalov.

They crossed the courtyard, climbed the stairs, walked down the glassed-in gallery and entered Nikolai's room. There, it was pleasantly cool. Bookshelves lined the wall above Nikolai's desk. A photographic enlarger stood on the floor in a corner of the room, like a stork on one leg.

Yura picked up the underwater gun Nikolai was making and examined it. "The spring's a bit tight."

"No, it's just right," said Nikolai. "Can't have it any looser."

"If you finish it by Sunday we can do some shooting."

"We're racing on Sunday."

"Why, so we are. I forgot." Yura stretched out luxuriously on the sofa.

"I want you to look at this," said Nikolai, producing several sheets of paper covered with sketches and figures from a drawer of the desk. "What do you think of it?"

Yura glanced at the sketches. "They look like pears." He yawned. "Take these drawings away. I'm too lazy to think."

"But first listen. Remember that conversation

about surface tension and the interesting idea Privalov suggested?"

"He told us to forget it."

Nikolai lost his temper. "You're an idiot! I can't discuss anything with you nowadays. All you can think of is Val."

"You're the idiot," Yura replied cheerfully. "All right, let's have it."

Nikolai turned on the fan. "What shape does a liquid have?" he asked, lighting a cigarette.

Yura lifted his eyebrows. "It takes the shape of the vessel into which it's poured. Primitive man guessed that much."

"Very well. Now take a drop of liquid. What keeps the liquid in a droplet? Surface tension. No vessel is needed. A sphere is the ideal shape of a minimum surface. But a droplet is not spherical. The earth's gravity gives it a bulge, making it pear-shaped."

"In short, a drop-like shape."

"Exactly."

There was a knock on the door. A tall, husky man in a white singlet and blue jeans entered. He had a broad, heavy-jawed face, and there was a tuft of red hair on top of his head.

"Caught you in at last, Nikolai," he said in a deep, hoarse voice. "Where've you been hiding?"

"What can I do for you, Uncle Vova?" Nikolai asked.

"I want to borrow your aqualung for a couple of days."

"My diving gear?"

"Don't worry, you'll get it back in perfect condition," he said reassuringly. "I'll refill the cylinders too."

"All right, take it."

Uncle Vova picked up the aqualung and inspected it.

"Fine workmanship," he remarked. "Thanks."

"When did you return?" asked Nikolai.

"Sunday. By the way, I saw you pull that girl out of the sea. You made a neat job of it."

"Why, it looks as though the whole town saw it."

"Really?" Uncle Vova pricked up his ears. "Who else?"

"The whole ship. You were on the *Uzbekistan* too, weren't you?"

"Oh, I don't give a damn about the *Uzbekistan*," Uncle Vova replied vaguely. "Well, I'm off." He nodded and went out.

"Now Yura, listen to what—" At this point Nikolai noticed that Yura, his long legs hanging over the edge of the sofa, was sound asleep. Nikolai shook him by the shoulder. Yura jerked a leg and pushed his friend away without opening his eyes.

"Wake up this instant or I'll shake the life out of you!" Nikolai shouted.

Yura opened his eyes. "I must have dozed for a moment," he remarked with a conciliatory smile.

"You certainly did. Get off the sofa."

"I'm more comfortable on it. You can continue talking. We stopped on droplets being droplet-shaped. It sounds fascinating."

"Are you trying to be funny?"

"Not for the world."

"Then listen. The size of a droplet depends on the magnitude of the surface tension. In the case of water"—Nikolai glanced at his notes— "the surface tension is 72.8 ergs per square centimetre. The surface tension of alcohol is a little more than 22 ergs."

"What is it for mercury?"

"Mercury? Just a minute." Nikolai took down a thick reference book from a shelf and leafed through it. "Just listen to this! The surface tension of mercury is 470 ergs. That's terrific!"

"You can increase the tension by passing an electric current through the mercury. Don't you remember reading about that old 'mercury heart' experiment?"

"Why, that's right. Thanks for recalling it, Yura."

Yura made a regal gesture. "Think nothing of it."

"We'll set mercury aside for the time being," said Nikolai. "Now consider the following. Have you noticed the way water runs along telegraph wires in the rain?"

"An intriguing sight, isn't it?"

"The flow has a droplet-like cross-section," Nikolai went on. "Suppose we use an electric ray instead of a wire. The ray creates a field. The field increases the surface tension, and the cross-section builds up."

"Better not tangle with fields, old man. You and I don't know much about them."

"We won't really tangle with them. All we need is a high-frequency generator."

"Let's have a look at those papers," said Yura after a pause. "What does this diagram represent?"

Nikolai sat down on the sofa beside him.

"Look here," he said. "We'll string up an inclined wire and send water down it to a vessel at the bottom. Since we know the time and the amount of water we'll be able to calculate the speed at which it moves. We'll measure the cross-section of the droplets and calculate their surface

tension. Then we'll put a spiral round the wire—"

"I get the point—a resonance circuit and superimposed frequencies." Yura sprang to his feet. "Give me some wire!"

Nikolai's grey eyes wrinkled in a smile. Once Yura was hooked on an idea his energy knew no bounds.

Yura pulled off his shirt, tossed his hair back off his forehead and produced a screwdriver from his pocket. It was his favourite screwdriver, for which he had made a hollow plastic handle, with a neon indicator lamp inside it, in his student days. He carried the screwdriver everywhere he went. Like Roland's sword, it had a name of its own. It was called Durandal.

"We'll disembowel your radio set for a start," Yura said. "But don't worry, we'll only remove the input circuit. And the heterodyne." He turned the set over on its side and went at it with his screwdriver. "We'll take out the giblets. Don't just stand there, Nick. Go out on the gallery and put the wire up."

Working away busily, Yura went on. "A great man once said the true experimenter can set up any kind of experiment with three sticks, a piece of rubber, a glass tube, and some of his own saliva."

CHAPTER FIVE

IN WHICH THE READER GETS TO KNOW ANATOLE BENEDICTOV BETTER

Anatole Benedictov switched on the motor. The belt drive made a rustling sound and the glass disc of the electrostatic machine began to revolve. Blue sparks crackled.

A round aquarium on the table had wire wound around it, with thick copper tubing on top of the wire. A copper disc hung above the aquarium parallel with the surface of the water. Small fish darted about in the greenish water.

Benedictov turned the levers of the valve oscillator. Then, slowly tightening a screw, he brought the copper disc close to the water.

The fish stopped darting about. They seemed to fall asleep instantly. Benedictov looked at his watch, dropped heavily into an armchair and closed his eyes.

The room was shrouded in semi-darkness. Rita sat on the sofa. A black cat lay at her feet.

"You ought to give up these experiments, Anatole," she said thoughtfully. "You're biting off more than you can chew."

"It's too late, Rita. I can't give up now."

There was a silence. The electricity crackled. The fish in the aquarium slept.

"Why do you keep experimenting with living creatures, Anatole?" Rita asked, leaning forward. "Your old-time predecessors used inorganic matter."

"You know why. Living matter gives me something a piece of wood or a chunk of metal never could. It gives me action potentials."

"But the knife is lost. How can you continue experimenting without it?"

"I don't know. I need that knife all the time." Benedictov paused, then added, "Did you actually see it fall overboard? Could someone in the crowd have grabbed it?"

"No, it went overboard. I dived after it at once, but the knife sank to the bottom."

"What a thing to have happened!" Benedictov rubbed his shaggy head furiously.

The doorbell rang. When Rita opened the door she found a husky man in blue overalls and a cap pulled down over his eyes standing there.

"I'm from the municipal electricity board," he said. "I've come to inspect the wiring."

"Step in," said Rita. "The meter's over there."

The electrician removed the fuses and inspected them.

"These have to be replaced," he said. "They're defective."

"Rita!" Benedictov called from his room. "Why did you switch off the electricity?"

"Hurry up and put those fuses back," Rita told the electrician.

"Are you in a hurry to be fined?" said the electrician, but he put back the fuses. "Where's the kitchen?" He went through the rooms, his head tipped back, looking at the wiring. Suddenly he stopped short. "Is that a motor running?" he asked. "Got a license for it?"

"Rita!" Benedictov called impatiently.

"Excuse me a moment," Rita said to the electrician as she turned towards Benedictov's study.

The electrician heard her explaining what the matter was. A man's voice said, "To hell with him! Let him look. Here, hold this fish."

"Ouch!" Rita exclaimed.

The electrician glanced into the room in time to see the woman drop the fish and a big black cat spring to seize it.

"Shoo!" cried Benedictov.

The electrician jumped back from the doorway as the cat, covered with blue sparks and screeching piteously, dashed into the passage. Its fur

stood on end, the sparks crackling. The cat ran frenziedly between the electrician's legs, received a kick, and bounded down the passage.

"The cat thought I tossed the fish to her," Rita said with a laugh as she came out of the study. "Have you finished looking things over?"

Benedictov followed his wife into the passage.

"Who are you?" he asked the electrician in alarm. "What do you want?"

"I ought to fine you for such goings-on," the electrician growled hoarsely, tugging his cap down over his forehead. He strode to the door, pulled it open and went out, slamming the door behind him.

After the war Bugrov returned home to his flat in Cooper Lane where a circus poster, now yellowed, still hung on the wall beside his bed.

Soon afterwards he married a stately, imperious woman named Claudia. She hid the poster in the lower drawer of the bureau, placed little rugs and embroidered cushions here, there and everywhere.

Bugrov did not return to the circus. He obtained a medical certificate stating that he was a disabled veteran and began to make spring dynamometers at home for a small producers' co-operative of disabled war veterans.

When Bugrov saw Benedictov's strange knife on board the *Uzbekistan* on his way home from a holiday on the Volga he immediately realized that such a knife could be a gold mine in a circus act. He carefully noted the place where the woman in red had dived overboard. When the passengers from the *Uzbekistan* went ashore he took a taxi and followed Benedictov to his home.

Bugrov hesitated for several days before finally deciding on direct action to learn whether the man still had the knife or whether it had sunk to the bottom of the Caspian.

"It was a waste of time," Bugrov thought gloomily as he walked to the trolleybus stop. "I didn't learn anything about the knife. All I did was tangle with a cat." Recalling the black cat covered with sparks he spat on the ground in fury.

Vova Bugrov did not know that cats possess excellent electrical properties, although they could hardly be a source of electric power. It has been estimated that if 1,500 million cats were stroked simultaneously they would generate a mere 15 watts.

"But maybe it wasn't a complete loss, after all," Bugrov reflected in the trolleybus. "The cat's owner was out of sorts. He swore and shouted at his wife. He might have been upset because the knife sank into the sea. Why didn't I grab it? I should have kept my eye on the handle. Well, I'll have to search the sea bottom."

Bugrov fell into a daydream about a wonderful circus act. The day he arrived in a small town posters would be pasted on all the fences showing Bugrov in a red robe—no, a green robe would perhaps be better—and a turban, with a knife piercing his throat. "Famous Fakir so-and-so" the poster would read. He'd have to think up a good name for himself. The hall would be jammed to the rafters as he, Vova, emerged on the stage in a green robe, or maybe a black robe.

He'd have to borrow his neighbour's scuba gear and do some diving. There was no silt in that place. Just sand. He was sure he would find the knife.

Bugrov pushed his cap to the back of his head and winked at his reflection in the trolleybus window.

CHAPTER SIX

IN WHICH NIKOLAI OPRATIN TAKES THE BULL BY THE HORNS

Nikolai Opratin saw Benedictov as soon as he opened the door into the laboratory. Corpulent and dishevelled, the biophysicist stood beside a table around which ran a thick copper coil. He was unfastening the harness in which a brown and white dog hung. When he set the dog on the floor it shook itself and began to sniff angrily at the experimenter's feet.

"Good morning," Opratin said.

"What do you want?" Benedictov asked coldly.

"Your advice about fish."

Benedictov turned away. "Ask someone else."

"I'm sorry about that argument we had on board the ship," Opratin said softly. "I'm ready to take back my words."

The biophysicist was silent. Then he nodded in the direction of the glass partition at the end of the laboratory. "Come this way," he said jerkily.

They sat down opposite each other at a table covered with papers and blocks of paraffin cut into cubes.

"The problem we're working on is the level of the Caspian, that is, how to raise it," Opratin explained. "We plan a series of experiments in the course of which ionized water will appear in the sea. My question is: how will this affect the fish?"

Benedictov gave a cough but said nothing.

"Our Institute will of course get in touch offi-

cially with yours," Opratin went on, his gaze fixed on Benedictov's face. "But I'd like to know, ahead of time—"

"What are your ionization figures?" Benedictov asked, moving closer a spirit lamp on which stood a nickel-plated tray.

The conversation faltered. Benedictov answered questions in unwilling monosyllables. He coughed and squirmed in his chair. His bloodshot eyes were evasive.

Suddenly he rose, murmured an excuse, and left the room. Opratin let his eyes roam over the table. He noticed an empty glass ampoule. As he read the Latin inscription on it his thin lips twisted in an ironic smile.

Benedictov returned looking a completely different man, fresh-faced, cheerful, with sparkling eyes.

"Please continue," he said on his way to his desk.

"Look here," said Opratin softly. "Did you try to magnetize that knife?"

Benedictov stopped short. Opratin's pale blue eyes stared steadily at him without blinking. Benedictov felt acutely uncomfortable.

"What's it to you?" he muttered.

The ensuing silence lasted several seconds. Benedictov was the first to lower his eyes.

"Sit down," Opratin said. "I'm not asking out of idle curiosity. I've been thinking a lot about your knife and it seems to me I've guessed a few things. Can it be magnetized?"

"Suppose it can? So what?"

"This is extremely important. Don't look at me as if you wanted to tear me to pieces. I've come here to help you."

"I don't need any help."

Opratin let this remark pass. "Did you measure the knife's electric resistance?" he asked. "Did you test it for use as the core of an electromagnet?"

Benedictov had not done that either.

"Did you try it on a voltaic arc?"

Benedictov shook his head thoughtfully.

"How does the knife react to chemical substances?"

He flung question after question at Benedictov. Benedictov gave reluctant replies. He had not performed half of the tests about which this uninvited inspector was asking him.

"Well, well," said Opratin. He smoothed his thinning hair. "To all appearances, my dear man, you have followed the wrong path."

"What path I follow is my own business," Benedictov growled.

"Yes, to be sure." Opratin drummed his fingers on the table. "You're a biologist and I'm a physicist. Don't you think that if we combined forces we'd reach the goal faster?"

Benedictov said nothing.

"I won't lay claim to any of your laurels. I just want to help you. All I'm interested in are the scientific results." Opratin looked searchingly at Benedictov. "What do you say?"

The biophysicist glanced out of the window. "Damn it!" he said flatly.

CHAPTER SEVEN

IN WHICH A REGATTA BRINGS THREE OF THE CHARACTERS STRAIGHT TO THE PLACE WHERE THE AUTHORS WANTED THEM TO BE

Early Sunday morning Nikolai Potapkin ran down the steps and out into the courtyard, swinging his little suitcase. The sleeves of his white shirt were rolled up above the elbows, his open collar exposed a tanned chest. Glancing up at the cloudless sky, he shook his head. Not a breath of wind! Yet this was the day of the big regatta.

He arrived at the marina to find preparations in progress only on the centreboard and Star class boats, for which even a slight breeze would be enough. The crews of the L-4 boats, discouraged by the absence of wind, were gathered in their cabins in front of TV sets watching a children's programme.

Nikolai found Yura sitting on the edge of the pier in his bathing trunks, his long arms wrapped round his knees, singing a song from an Indian film in a mournful voice. He sat down beside Yura and took up the refrain. They sang until dockmaster Mehti stuck his head out of the window of the boathouse and begged them to stop. "This isn't an opera-house," he complained.

"You shouldn't have lent uncle Vova your scuba gear," Yura remarked after a while. "We could have done some diving."

"Why not come over to my place if the races are cancelled? We might try to change the pitch of the spiral."

"I don't want to."

"Why not?" Nikolai looked at his friend. "Ah, yes, of course. A date with Val."

"No, I—"

"Then what the devil—"

"Nothing will come of it, Nick. The surfaces of substances are a hazy subject. If famous scientists don't know how to handle them, then what's the use of us trying?"

"You needn't if you don't want to. I'll get along without you."

"You can't. At least I know my way about electronics, which is more than you can say."

"Anyway, I won't give up. There must be a field in which surface tension increases."

"A field!" Yura repeated derisively. "'Oh, field, broad field, who strewed you with whitened bones?'"

Boris Privalov came up to the young men. "Good morning, boys. Doesn't look as though there'll be any racing today, does it?"

"The races haven't been officially called off yet," said Yura. "We're waiting. Take a seat."

The three of them sat side by side on the pier, dangling their feet in the water, the sun warming their backs, waiting for the wind to come up.

"Do you recall our talk about surface tension, Boris?" Nikolai asked in a determined voice.

The sun flashed on Privalov's glasses as he turned to look at Nikolai. "Yes, I do."

"Well, it's like this." Nikolai launched into a description of the experiment with water and a wire, and mentioned the spiral and the desired field.

Privalov listened closely, frowning and screwing up his eyes.

"It's amateurish," he said finally. "You can't go in for that sort of thing without thorough preparation. There's a book by Adam on the physics and chemistry of surfaces. I'll lend it to you." He was silent for a while. "Besides, at the moment we have more than enough work on our hands, and later there will be a pipeline across the whole of the Caspian."

"I've been hearing about a transcaspian pipeline for years," said Yura. "We're beginning to wonder whether it will ever be built."

"It will. I forgot to ask you yesterday, Nikolai, if you went over to Opratin's."

"Yes, I did."

"See anything interesting?"

"Not particularly. I think they're setting up a big electrostatic installation."

"Electrostatic, you say?" Privalov looked thoughtful.

Yura sprang to his feet. "A wind! A wind's coming up!"

A light southerly sea breeze ruffled the surface of the bay and rustled in the trees along Seaside Boulevard. The flag of the Chief Judge fluttered tautly.

A ship's bell tinkled. The class M flag was run up.

"The centreboard boats are getting ready," Yura said excitedly. "If it blows a little stronger the keel boats can follow suit. Let's go."

After the centreboards the Star class boats started off. There was enough wind for these small, light boats which carried a great deal of sail.

The wind freshened, and half an hour later boats of the L-4 class were announced. Soon the steady ringing of a ship's bell informed the competitors that five minutes were left before the start.

Ah, those last five minutes! What a tricky business it was getting as close to the starting line as possible within those five minutes, but not crossing it ahead of time!

Four rings of the bell meant four minutes were left, then three, two, and one. Finally, a quick ringing of the bell gave the signal for the start. Beating against the wind, the boats entered the first lap of the fifteen-mile course.

Wind filled the sails as the sheet, held in strong hands, quivered; the sea whispered to the boats sliding through it; the sun bathed everything in gold against the blue of the sea.

The *Mekong* was among the first to round the mark. Following an advantageous course, it approached its closest rival on a parallel course windward, but the other boat did not let the *Mekong* overtake it. In the excitement both crews forgot about the other competitors. When the *Mekong* finally forged ahead, the crews discovered that almost all the other boats had overtaken both of them, were rounding the second buoy and were raising their spinnakers, the big triangular sails used when running before the wind.

Yura, who was sitting on the deck, raised himself on one knee. "Obstacle ahead!" he shouted. "Two boats lying at anchor!"

When the *Mekong* came closer they saw a man in a straw hat sitting in one of the boats. They could hear the motor running, but the boat was not moving.

The second boat, some distance away, was empty.

"Ahoy there!" Yura shouted, leaning over the side. "Watch out!"

Just then the wind died down, prompting the thought that Nature is sometimes actively hostile to man. Why else should the wind die down at noon on a Sunday just when a regatta is at its height?

The sails flapped several times and then hung limp. The *Mekong* continued to move forward a short distance by inertia before coming to a full stop about half a cable length from the motorboat.

"Well, all we can do now is sunbathe. What a race!" said Yura in disgust. Whistling softly, he scratched the boom with his fingernails, then threw a ten-kopek coin oveboard. But these century-old remedies failed to call up a wind.

"I've done everything I can," Yura announced. Then he stretched out on the deck and began to sing in a doleful voice:

> The river flows but it doesn't flow;
> The day got off to a bad start.
> How can I tell you what's in my heart?
> But I think you probably know.

Nikolai glanced at the distant shore and the refrigeration plant outlined against the blue sky.

"Why," he said wonderingly, "I believe this is the spot where we rescued that young woman in the red dress."

All of a sudden silence descended as the motor of the boat ahead was switched off. They heard an angry voice say:

"I came here first. Everything I find here is mine."

"Don't be silly," another voice said. "The sea doesn't belong to you. It belongs to everyone."

"I'll show you who it belongs to!"

The motorboat rocked as the man in the straw hat waved his arms.

"I wonder who he's talking to?" Nikolai looked more closely at the motorboat. Then he fetched his binoculars from the cabin and trained them on the straw hat. "Just what I thought. The voice sounded familiar. That's Opratin."

"Give him my regards," Privalov said.

"Damn it!" Nikolai exclaimed. "You spoke of wanting the scuba gear, Yura. Well, there it is."

Taking the binoculars, Yura clearly saw Bugrov's big head in the water beside the motorboat. The mask was pushed up on Vova's forehead and he was clinging to the boat with one hand.

Yura lowered the binoculars. "You're right. The diving gear is in danger. It looks as though they want to drown each other."

"I'd like to know what they're doing here," said Nikolai. "Do you mind, Boris, if I take a short swim?"

"Don't be too long. The wind may come up any minute."

"I'll be back soon." With these words Nikolai plunged into the sea and swam towards the motorboat.

"Come, Yura," said Privalov, lighting a cigarette and letting the smoke out through his nostrils, "tell me about your experiments once again."

That morning Nikolai Opratin had spent more than an hour on the small wharf belonging to

the Institute of Marine Physics. He had attached a cable drum to the side of an Institute motorboat and had wound on it a thin cable with a strong electromagnet at its end.

Anatole Benedictov had said the knife could be magnetized. If this was so, then he, Opratin, would find it. How stupid that the knife should have fallen overboard! And what a scene Benedictov had made on deck! Opratin recalled the glass ampoule on the biophysicist's desk. A drug addict.

Yet without that scene on deck he, Opratin, would not have learned of the existence of the mysterious knife. A drop of common sense in a barrel of nonsense.

Opratin finished equipping the boat, started up the motor, and chugged out of the bay.

The sea heaved lazily beneath the hot August sun. The red cone of the fairway buoy with a big white "18" painted on it rocked on the surface. The TV mast was at Opratin's stern and the refrigeration plant on the left. He turned the boat a few degrees to starboard.

Now this must be the place. This was where Benedictov's wife had fallen overboard after the knife had dropped into the sea. An interesting woman, no doubt about that. Had she fallen or had she jumped?

An empty boat bobbed in the water about twenty metres away. Where was the owner? Had he drowned? Or had the boat torn free of its moorings and drifted out of the bay? Opratin was not in the least interested. He pushed a lever which switched the motor's drive from the propeller to a generator to which the cable with the electromagnet was attached. The cable wound off the

drum into the water. Opratin wondered how soon his particular fish would bite.

At the end of the cable was an electromagnetic underwater probe connected with an ultrasonic range-finder. The zigzagging green line on the oscillograph screen would show the shape of metallic objects on the sea floor. If Opratin wanted some object he could switch on the electromagnet and pick it up.

Using the oars, Opratin slowly moved the boat back and forth, combing the place. Suddenly the cable jerked. Bubbles rose to the surface, then a huge hand was thrust out of the water, followed by a head, the face covered by a mask. The mask was connected by a hose to a cylinder on the man's back.

The diver closed the valve of the aqualung and pushed the mask up onto his forehead, revealing a broad face with a heavy jaw. Opratin recognized him at once. He was the man who had tried to take the knife from Benedictov aboard the *Uzbekistan*. It was obvious why he was at this particular spot in the sea. An unpleasant situation.

While the diver coughed and spat out water Opratin decided to take the offensive.

"Hey you, there!" he shouted. "Why the devil did you pull my cable?"

"You'll soon find out!" came the answer in a threatening tone. The man swam over to Opratin's motorboat, reached up to grip its side, and let loose a stream of obscenities that set Opratin's teeth on edge. The substance of Bugrov's monologue was that law-abiding citizens could not go in for skin-diving on their day off because "others"—a word which Bugrov procee-

ded to define—played all kinds of dirty tricks on them.

Bugrov had been combing the area in circles. He would anchor his boat, dive down and swim around in a circle, studying the firmly-packed sandy bottom. His supply of air was almost half used up when he saw a black cylinder suspended from a cable slowly moving over the bottom. He swam up to the cylinder and tugged at it, gripping the place where it was attached to the cable. An electric shock galvanized him, and he tore his hand away with difficulty. Dazed and angered, he headed for the surface.

Bugrov had been having bad luck with electricity lately.

"Get going, quick—before I turn your tub upside down!" he roared.

Opratin did not want any trouble, the more so that a sailboat was approaching. He moved over to the stern and said in a placative tone, "Listen, how was I to know you were swimming here?"

"Couldn't you see my boat? Stop acting innocent, you scum!"

They wrangled for another few minutes, until Opratin realized he was being foolish and would have to get rid of the man some other way. He switched off the motor, gave the becalmed sailboat a fleeting glance, and said, "I know what you're looking for, but you'll never find it with an aqualung."

Bugrov blinked in disbelief.

"D'you take me for a fool?" he asked hoarsely. "Get out! I came here first. Everything I find here is mine."

"Don't be silly! The sea doesn't belong to you. It belongs to everyone."

"I'll show you who it belongs to!" Bugrov began to rock the motorboat. Opratin had to throw out his arms to keep his balance.

"All right, I'm leaving," Opratin said, strongly tempted to hit the man over the head with his anchor. "But you'll never see that knife. You can take my word for it as a scientist."

This made an impression on Bugrov, who had a deep faith in the omnipotence of science.

"Are you looking for the knife too?" he asked in what was almost a civil tone.

"There, that's the way to talk," said Opratin. "Yes, I am. If I don't find it I'll make one just like it."

Bugrov gave the face under the straw hat a thoughtful glance.

"I'm apt to be quick-tempered," he said. "Maybe I said some things I shouldn't have."

Opratin gave a wry grin.

Nikolai quickly covered the hundred metres or so to the motorboat in a noiseless breast stroke. As he approached it he heard Bugrov say, "All I want is the knife. I'm willing to make sacrifices for science."

"I'm glad to hear it," said Opratin.

"I am what I am," Bugrov said modestly. "Will I be going to the island often?"

"No, not very."

"There's a fishery nearby. I can get caviar cheap there." He fell silent, his head filled with visions of future profits.

At that moment Opratin caught sight of Nikolai beside the boat. He removed his dark glasses to take a better look.

"Is that you?" he asked with a pleasant smile. "What an unexpected encounter!"

"Hi, there," called Bugrov, recognizing his neighbour. "Where'd you drop from?"

"That sailboat," Nikolai caught hold of the motorboat's life line. "We're becalmed, so I decided to take a swim."

An awkward silence followed.

"I'll be on my way," said Bugrov, pushing off from the motorboat. "Do you want your scuba gear now?"

"No," said Nikolai. "Bring it to me at home."

Bugrov swam back to his rowboat.

"I see you know him," remarked Opratin.

"Yes, we live in the same house." Nikolai stared at the generator, the face plate of the cathode-ray tube of the oscillograph and the drum with the cable running into the sea.

Opratin smiled. "How I envy you. Sailing is a wonderful sport. But I, as you can see, have to carry out investigations on Sundays too."

"Yes, I see," said Nikolai, trying feverishly to make out what sort of cable it was. "Well, good luck."

He pushed off from the motorboat and swam back to the sailboat. If only he had known the circumstances under which he would cling to the life line of that motorboat a second time!

CHAPTER EIGHT

IN WHICH PRIVALOV ACQUIRES A NEW ALLY

The wheel now worked well. Unwinding the "spool", a tug had laid the first pipeline to Neftianiye Reefs. The pressure trials completed, they

returned home towards evening. At this time of day there was not much traffic on the road, which ran between vineyards, with oil derricks beyond them, and their sleek grey car made good time.

Privalov relaxed in the back seat, satisfied after two days of intensive work. Pavel Koltukhov, who sat beside him, dozed and smoked simultaneously; he woke every now and then to take a puff or two on his cigarette and then closed his eyes again.

Nikolai was at the wheel. Beside him Yura was going through his notes on the pressure trials.

"That's a load off my mind," Privalov said with a sigh. "I hope the builders will be able to handle the parallel pipelines without us."

"You can gird your loins for another job," said Koltukhov.

"You mean the transcaspian pipeline? But the project hasn't been approved yet."

"Approval was wired yesterday. Is your survey programme ready?"

"It's been ready a long time."

"That's fine. We'll discuss it tomorrow."

Nikolai slowed down as they passed through a small town and then put on speed when they came out into open country again.

"How are things going, boys?" Privalov asked in a low voice. "Have you read that book by Adam?"

"It isn't what you'd call light reading," Nikolai replied. "We're stuck, Boris. We're thinking of experimenting with mercury."

The remainder of the drive into town passed in silence. After the young men got out on the corner of Toilers of the Sea Street, Privalov took the wheel and drove to the Institute.

"Look here, Boris," said Koltukhov. "Do you think it's fair to let your imagination run wild and make those two young men pay for it by wasting their time and energy?"

"I'm not making them do anything. They started experimenting without sufficient theoretical grounding. I told them what to read and gave them some advice. That's all."

"Then why does Nikolai spend every free minute of his time in the automation department, showering everyone there with questions?"

Privalov shrugged his shoulders. "Aren't you letting your own imagination run wild? Dabbling in resins like an alchemist, in between conferences?"

"I'm doing something useful. I'm improving pipeline insulation materials."

"But you've done that already. Now you're making some smelly new compounds. People have to hold their noses when they go past your den under the stairway."

Koltukhov merely grinned.

"All right," he said, lighting another cigarette. "I'll let you in on my secret. My idea is a much better one than yours. How do we protect our pipes and steel structures from corrosion by sea water? By covering them with insulation. Besides being expensive, this method isn't always dependable. When cracks form in the insulation, corrosion goes ahead faster than ever, as you yourself know. Another way of controlling corrosion is by using electricity, but this is expensive too, and it involves a lot of work. You have to string transmission lines and bring a positive charge to the pipeline. My idea is a plastic coating that

would serve as insulation and have an electrostatic charge at the same time."

"Not a bad idea," said Privalov. "But mine is better. It does away with both pipes and insulation."

Koltukhov dismissed it with a wave of his hand. "You talk like a college boy, Boris."

The car drove into the Institute yard.

"Is old man Bagbanly in town?" Privalov asked.

"I think so. Why?"

"I'd like to get in touch with him."

"Yes, do go and have a talk with him. He'll throw cold water on your idea, if anyone does."

They sat on the balcony drinking tea. Professor Bakhtiar Bagbanly thoughtfully stirred his glass as he gazed out on the broad crescent of city lights skirting the bay. A Corresponding Member of the Academy of Sciences, he was a clever, erudite man with the skillful hands of a gifted experimenter. He had been Privalov's favourite lecturer when Privalov was an undergraduate twenty years before. Many of Professor Bagbanly's former students dropped in to discuss their work with him. He was generous with his knowledge and advice, and he addressed all the young people by their first names. They addressed him in the Eastern fashion as "Bakhtiar Muellim", meaning "Teacher Bakhtiar".

The old man had a large grey head, black eyebrows and a drooping silvery moustache beneath a hooked nose.

Professor Bakhtiar Bagbanly fixed his twinkling brown eyes on Privalov and said, "I didn't understand a thing. Your words are as vague as

the dreams of a camel. Now tell me straight out. What is it that you want?"

Privalov knew that the old man's brusque manner was not to be taken seriously, and so he let the "camel" bit pass unheeded.

"I'll begin from the beginning", he said, taking a sip of tea. "We're starting to design a pipeline across the bed of the Caspian."

The old man nodded.

"A pipeline, as you know, is not an end in itself," Privalov continued. "It is only a means towards an end, which is a regular supply of oil."

"What's wrong with using a pipeline to attain this end?"

"As far as that goes, nothing. But what is the purpose of the pipes? To separate the oil from the environment."

"That's well put."

"Please don't make fun of me, Bakhtiar Muellim. When it comes to the technique of transporting oil across a sea, or transporting one liquid through another in general, our thinking is conservative. How do our pipelines differ from those used in ancient times? Well, the pipes are more durable and the pumps more powerful. But the principle of the thing remains the same. Pipeline delivery is better than using oil tankers, of course. It's cheaper and it does not pollute the sea. But, you realize—"

"I realize that you don't like pipes. How do you propose to replace them?"

"This is what came to my mind." Privalov finished his tea and moved his glass aside. "I recalled Plato's experiment. If we take oil with the same specific weight as that of water and pour it into the water, surface tension will cause the

oil to assume the minimum shape and form a sphere. Isn't that so? But suppose we build up surface tension in such a way that it acts along two axes instead of three? Then one cross-section of the oil will be a circle and the other— In a word, the oil will take the shape of a cylinder. The surface of the oil will become a pipe, as it were."

Professor Bagbanly grinned and shook his head. "Ingenious! A pipe without a pipe. But please proceed."

"Further," Privalov continued enthusiastically, "we must have a field. Imagine an underwater power beam pulsed along a route. A definite frequency would generate a field in which the oil stretches along the beam. Do you realize what that would mean? A stream of oil running through the water from the west coast of the Caspian to the east coast."

"You've described the design of the steam locomotive to me," the professor said. "Now tell me how it can travel without being pulled by horses. What would make the stream of oil move?"

"Perhaps the energy of the beam itself. A conductor moves in a magnetic field if it crosses lines of force, doesn't it? I don't know yet, Bakhtiar Muellim. I'm just advancing a bare hypothesis."

"Bare and defenceless," the old man added.

There was a long silence. Then Professor Bagbanly rose and began to pace the balcony.

"You speak of surface tension," he said finally, "and you hope old Bakhtiar will gladden your ears with a harmonious concept. You nurse an idle hope, my son. The surfaces of matter constitute one of the fundamental riddles of modern physics. The surface tension of liquids is a zone

where the specific properties of surfaces manifest themselves. Surface tension produces forces that are always directed inwards. The tea in that glass is in a state of tension. Its surface presses inwards from the top and bottom and sides with a force of more than ten tons per square centimetre. Hence, liquids are well-nigh incompressible. Until recently it was thought that liquids could not be compressed at all. Or take solids. When we cut a piece of clay with a knife we disunite whole worlds and form new surfaces. In the process, energy is released."

"Just what lies under a surface?" Privalov asked.

"I don't know, my son. Nobody knows yet. How can you get under it? If you scrape off a surface, another surface of the substance immediately forms. It is the interface on which the interatomic forces that hold the elements of a substance together interact with the ambient medium and achieve a balance in some specific fashion. How? That is something we don't yet know. But if we get to know it, then sooner or later we'll penetrate to the heart of the matter. And once we have fathomed the secrets of surfaces we will proceed to utilize the colossal force latent in them."

"Do you mean to say that my idea is too far ahead of the times?" Privalov asked sadly.

"It well may be. Take an example which Shuleikin cites in his *Marine Physics*. When an express train brakes suddenly the enormous kinetic energy it releases is absorbed by the extremely thin surface layer of contact between the wheels and brake-shoes, yet this does not seem unbelievable.

"Suppose," Bagbanly continued as he walked

back and forth, "we succeed in increasing the surface tension and—"

"You agree, Bakhtiar Muellim!" Privalov almost shouted.

"Don't be in such a hurry. I assume that it is possible—theoretically, but not in reality."

"Why?"

"Because your oil 'sausage'—if you succeed in making one—will encounter tremendous resistance as it moves through the water. Friction, my friend. Friction is also a property of surfaces. The surface layers will tear away from the inner layers, and the jet will disintegrate."

"Excellent," said Privalov. "That means we have another job—that of reducing the friction."

Bagbanly dropped into an armchair and burst out laughing.

"You're wonderful, Boris," he said, wiping his eyes with his handkerchief. "Both friction and surface tension are child's play to you. You're even prepared to turn matter inside out."

"Well, I'll be going, Bakhtiar Muellim," Privalov said with a sigh. "Thanks for your advice."

The old man stared at him intently. "You know what? Take me in as a member of the team on this project. I'll work on it out of curiosity. Who knows what may come of it? But only on condition we don't go to extremes. We'll concentrate on the underlying principles and nothing more."

CHAPTER NINE

IN WHICH AN EXPERIMENT NOT ENTIRELY SUITABLE FOR THE HOME IS DESCRIBED

"Are you sure the knife fell overboard, Rita?" Anatole Benedictov said.

"Yes, I'm sure."

"Quite sure?"

"Well, really!" Rita laid aside her book and rose from the sofa.

"Don't be angry, darling. You see, a couple of men have hunted for the knife on the sea bottom at that place and they failed to find it."

"It would be easier to find a needle in a haystack."

"You've changed lately. Your attitude to my work is different. That's why I asked."

"You're the one who's changed, Anatole. You're simply stopped noticing me. Do give up those experiments. Please give them up. They'll drive you crazy. They've already come between us. Think of how wonderfully we were getting along before that ill-fated discovery."

"That's true," said Benedictov.

"We were, weren't we?" Rita asked hopefully.

Benedictov glanced at his watch. "A person is coming to see me in a few minutes. We'll be doing some work together."

Rita shook her head and silently left the study.

Anatole Benedictov had fallen in love with Rita several years earlier, when he was teaching at the University and she was a gay, vivacious biology student there. Shortly before that he had presented a brilliant thesis for an advanced degree

dealing with electric currents in living organisms, and had published a study of electric fish which had aroused much discussion among biologists.

During one of his lectures he had noticed several girls giggling and whispering as they passed a sheet of paper through the auditorium. He strode rapidly over to them and snatched up the paper. He looked down at it and frowned. What he saw was a sketch of himself, shaggy-haired, thickset, with a fish's tail, conducting with a trident as fish danced round him. Beneath the sketch were the words, written in a fine handwriting:

Neither fish nor fowl, neither physicist nor biologist,
He's an intermediate class electro-ichthyologist.

"Whose work is this?" he asked, letting his angry eyes roam over the auditorium.

A slender blonde girl rose. "It's mine," she said politely, her brown eyes gazing boldly into Benedictov's.

It was an announcement rather than a statement.

"Thank you," Benedictov said slowly, in a slightly nasal voice, thrusting the drawing into his pocket and continuing his lecture.

After they were married, Benedictov admitted to Rita that when she said "It's mine" he had suddenly felt a wave of heat engulf him.

As for Rita Matveyev, she had long been in love with the brilliant lecturer.

Rita graduated from the University the year they were married and started teaching biology in a secondary school. That same year Benedictov was given a laboratory at a research institute. Here he enthusiastically continued his investigations in the sphere of action potentials. The

young couple led a fast-paced life, keeping open house for their many friends.

Half a year before their cruise on the *Uzbekistan* the Benedictovs had moved into a new flat. On moving day there occurred a strange event which triggered a series of disasters.

Rita and her husband had decided to leave a lot of their old things behind when they moved. Anatole naturally protested when he found her putting an old flower vase and a rusty bar of iron into a packing crate.

"We agreed not to take such things, Rita," he said. "You ought to throw that trash away."

Rita discarded the vase but insisted that she could not part with the bar of iron, which had been in the possession of her family for years and years.

"A Matveyev relic?" Benedictov asked with a laugh, picking up the bar. He turned it over in his hands and shook it.

The blade of a knife slid out of the side of the bar.

Benedictov stared dumbfounded at the narrow blade. It was covered with a thin, transparent layer of grease through which a wavy pattern showed. He cautiously touched the blade. His fingers went through it—just as they would have passed through empty space.

He pressed his hand to his eyes.

"What's the matter?" Rita asked in alarm. She came up to him and glanced at the bar. Her eyes widened.

No, she didn't know anything about the bar except that according to an old family legend a distant ancestor had brought it back from India. Her father had treasured the bar all his life,

and now she was doing the same. No one had ever imagined there might be something inside it.

Benedictov held the bar as if it were a rattlesnake. He slowly closed his fist over the blade. His fingers came together over emptiness.

Rita gave a start. "Wait a minute," she said. "There was another bar just like this one, all covered with rust. We used it to prop up the old wardrobe that had a broken leg." She ran into the next room, returning a moment later to say, "It's gone. We must have thrown it out yesterday when we carted all that old rubbish away."

The first few moments of astonishment gave way to curiosity. Benedictov carefully examined the bar. Two lines of letters were engraved on one side. Between the two lines there was something that looked like a crown. Or it might have simply been a spot of rust. Benedictov noticed a fine line running round the outside of the bar. The whole thing was obviously not a solid bar of iron but a box with a cover.

After a long struggle Benedictov finally pried off the top. Inside the box lay a knife handle, with a piece of cloth wound round it. The cloth must have become loosened with time and when the box was shaken the blade dropped out.

There was nothing extraordinary about the beautiful handle of yellowed ivory. It could be grasped. He concluded that the section of the blade that went into the handle must be made of ordinary metal too, otherwise it would not remain attached to the handle.

But the blade itself! It passed freely through everything without leaving the slightest trace, as though it were made of thin air.

The first glimpse of the mysterious knife marked a turning point in the life of the Benedictovs. Anatole determined to get to the root of the mystery.

"Penetrability. The ability to pass through matter. That's the goal, Rita. You say this knife has been in your family at least two hundred years? Well, if they could make a knife that passes through matter you and I can certainly do the same."

Anatole painted glowing pictures of Altered Matter which man could easily control. Rita became enthusiastic too. She helped Anatole to set up experiments and kept a record of their results.

Weeks and then months passed. Benedictov turned his study into a small laboratory where, more and more frequently, he worked through the night. He grew impatient and irritable. Rita noticed that his behaviour had become strange. At times he would be depressed and sullen, and then he would suddenly become his cheerful, energetic self again, capable of working for days on end without resting. He fell into apathy just as suddenly.

Rita grew worried. She now realized that Anatole had taken on a job that was too much for one man. But when she tentatively suggested that he ought to let the Academy of Sciences know about his discovery he declared that he could not do this until he himself got to the bottom of it. With great difficulty she persuaded him to take her on a holiday cruise on the Volga.

We already know how disastrously their holiday ended.

When the doorbell rang, Anatole jumped up but Rita got to the door first. She opened it to Nikolai Opratin, who looked his usual dapper self in an elegant grey suit. Bending his neatly combed head, he touched his cold lips to Rita's hand and inquired after her health.

"I am in perfect health," Rita said, enunciating the words distinctly. "Goodbye."

"Hold on, there. Where are you going?" Anatole asked.

"To the pictures." The door slammed shut and the two men were left alone in the flat.

"All the better without her." Anatole growled, leading the way into his study.

Nikolai Opratin cast a critical glance over the equipment. Then he removed his jacket, carefully pulled up his trousers at the knees, and sank into an armchair. Benedictov sat down opposite him.

"First, Anatole, I want you to tell me in detail about the knife," Opratin began.

He listened closely to Benedictov's account.

"Indian magic. If I hadn't seen it myself I wouldn't believe it. Penetrability ends near the handle, you say?"

"Yes, there's a sort of intermediate zone of about six millimetres. The part that goes into the handle is ordinary steel."

"Did you weigh the blade?"

"Yes. The weight corresponds to the size."

"That's extremely interesting. It means the knife behaves like ordinary matter in the gravitational field."

"It seems to me," said Benedictov, "that the bonds between atoms, or perhaps within atoms, have been changed in some way in this knife.

I am convinced that the properties of living organisms, whose vital functions are connected with the discharge of energy in the form of action potentials, will provide the key to the riddle."

He went over to the round aquarium encircled by wire and launched into a discourse, but Opratin soon interrupted him.

"I get the picture, Anatole," he said courteously but firmly. "You put the fish between the plates of a capacitor in an oscillatory circuit and look for a resonance in the bioelectrical frequency of the fish. I don't think this avenue will lead you anywhere. You're right, though, about one thing —that the inter-atomic bonds in the knife were altered. But how was the energy of the intrinsic bonds of this substance overcome? If we only had the knife now! By the way, you said it lay inside an iron box. You haven't lost the box too, have you?"

Benedictov took a small iron bar from a drawer and held it out to Opratin. It looked something like a pencil case.

Opratin sprang to his feet. "What the devil!" he exclaimed. "The same letters!"

Engraved on the cover were the letters "*A M D G*". Below the letters a crown had been engraved, and below that were "*J d M*" in smaller letters.

Opratin walked the length of the study and back again, his steps ringing like the pounding of a hammer.

"What's the matter?" Benedictov asked, turning his head to follow Opratin. "What's upset you?"

"Oh, nothing much. What do those letters stand for?"

"The upper four are the initial letters of a Jesuit motto but I don't remember it. I don't know what the bottom ones stand for. It's unlikely they have anything to do with our problem."

"Well, let's not lose time setting up our first experiment. When you described your generator I got an idea. Was a crate of instruments delivered to you today?"

"Yes. By the way, were you the one who sent that ape to this place disguised as an electrician?"

"How could you ever think that? He's my laboratory technician. Extremely useful, and not a bad fellow at all. But to get back to business. I think we should begin with a minimum surface, with the point of a needle."

Opratin opened a case and took out a metal holder to which a long, highly polished needle was attached. Then he briefly set forth the method of the experiment.

The equipment lay on a small table, under a binocular magnifying glass. The needle and the holder were placed in a screw-clamp with a micrometre screw in such a way that the needle point was close to a steel cube. All this was inserted in a coil between parallel plates and enclosed in a thick-walled vessel. Wires connecting the apparatus with the electrostatic machine and the oscillator ran through holes drilled in the glass.

"Now we'll see what your oscillator is capable of," Opratin remarked. "Well, here we go. We'll try to make the electric field act on the intrinsic bonds of the substance of this cube."

The disc of the electrostatic machine began to whirl, humming softly.

"Switch on the oscillator," Opratin commanded.

A tumbler clicked. Inside the glass vessel the

little motor slowly turned the micrometre screw, bringing the point of the needle closer and closer to the cube.

Opratin and Benedictov kept their eyes glued to the magnifying glass.

A bell tinkled as the tip of the needle came into contact with the cube. The automatic recorders were switched on. The point continued to move, penetrating into the steel. But the sensitive instruments did not record any force. The needle was entering the steel cube without meeting resistance!

That lasted only a moment.

The next instant Opratin and Benedictov were flung against the wall. The glass chamber was shattered to smithereens.

Benedictov looked round. He was overwhelmed. Had it all been a dream?

Opratin rose to his feet. His face was pale. Blood trickled down his forehead.

"The cube!" he cried. "Where is it?"

They found the cube in a corner beside fragments of the screw-clamp. When they examined it under a microscope they could not find the slightest trace of a hole made by the needle. But the automatic recorder, an impartial witness, told them that the needle had penetrated into the steel to a distance of three microns.

The two scientists sank into armchairs facing each other. For a time they were silent.

"What," Benedictov finally said, "do you think of the whole thing?"

"I think it was a great moment." Opratin spoke in a calm voice and his face now wore a somewhat detached expression. "We achieved penetrability for an instant by weakening the bonds

of the substance of the cube. But the energy that created those bonds was released—and that was what hit us."

After a long pause he continued, his voice calmer than ever: "We've made a start, Anatole. But we won't get anywhere working at home. Once we're invading the structure of matter there's no telling what kind of blasts may be produced. We must build a big installation. We'll need a Van de Graaff generator without fail. We're going to conduct a great many experiments."

"What do you propose?"

"I can arrange matters so that I work by myself, without any outsiders poking their noses in. But what about you? You aren't a member of our staff, unfortunately." Opratin fell silent. Then he said bluntly: "You'll have to join the staff of the Research Institute of Marine Physics."

Nikolai and Yura had been experimenting with mercury in the small glassed-in gallery in Cooper Lane for several days. They had put together a "mercury heart", an old-fashioned apparatus used to demonstrate how electric current builds up surface tension.

The device was assembled on one pan of a laboratory scales. A large drop of mercury was covered with a solution that would conduct electricity. A screw with a needle lay so that the point of the needle touched the mercury. The drop of mercury was connected by the conducting solution to the anode of a storage battery and the needle was wired to the cathode.

A weight on the other pan kept the scales balanced.

The electric current increased the surface tension, making the drop of mercury shrink and move away from the needle. But when the circuit was thus broken, the drop of mercury spread out until it again touched the needle. This "mercury heart" pulsated continuously.

The young engineers tried to act on the "heart" with high frequency current by winding a spiral round the apparatus and linking it up with a valve oscillator. They hoped a certain definite frequency of oscillations would greatly increase the surface tension of the mercury and squeeze it to such an extent that it would no longer touch the needle. Then, by adding mercury and registering the increase in the weight of the drop, they could measure the degree to which the surface tension had increased.

They tried different shapes of spiral and different frequencies but nothing came of it. The "mercury heart" continued to pulsate with the same calm, steady rhythm.

"We're not getting anywhere," said Yura, turning off the current. "We're just wasting our time."

But Nikolai patiently continued to vary the experiment.

CHAPTER TEN

DESCRIBING A FIND THAT COMPELS THE AUTHORS TO END PART ONE AND SWITCH TO THE FIRST HALF OF THE EIGHTEENTH CENTURY

The rusty iron bar that Privalov brought home from the bazaar lay at the bottom of the pantry for more than a fortnight. Privalov had not forgotten about the bar but simply had no time to examine it.

Finally, one afternoon, he attached a vise to the kitchen table. Humming a popular tune, he laid out his tools. His wife Olga, who was doing up the dishes, frowned.

"I wish you wouldn't bring home so much junk," she grumbled. "What do you want that dirty piece of iron for?"

Meanwhile, Privalov had put the bar into the vise and was removing a thick layer of kerosene-softened rust with a sharp scraper.

"It's not iron," he said. "Don't you remember? I once told you that iron is rarely met in its pure state. It is usually alloyed with carbon to make steel. The element iron, or ferrum, is found in a pure state only in laboratories. Incidentally, it hardly ever rusts. All the rust on this bar means that it is steel."

"What about stainless steel?"

"Stainless steel is just a name. There is sometimes more chromium and nickel in it than iron.

"I seem to be learning lots of new things in my old age," Olga said, wiping a plate. Her eyes

were amused. After a time she said, "Let's go to the cinema, Boris. I know where 'The Sorceress' is on. It's an old picture, but we haven't seen it."

"I have nothing against 'The Sorceress'," said Privalov as he scraped away. "You know I've always stood up for witches, magicians and goblins. But before we deal with the occult sciences I'd like to see what's inside this little box."

"Box? Do you mean to say this little bar is hollow?"

"Exactly. The moment I picked it up at the bazaar I noticed that it's too light for its size. But I didn't see any joints, and I wanted to learn how it's put together."

"Be careful, Boris. It could be a booby trap."

"That's not likely. I don't see a single opening for a fuse or a safety lock."

"But what if it really is one?"

Privalov grinned. "You remind me of the grandmother in Tolstoy's *Childhood*. Remember? She refused to listen to an explanation of why small shot isn't the same as gunpowder."

"A very flattering comparison."

"Don't fly into a huff. You see, the box was made very long ago, before delayed-action mechanisms were invented." He set a frying pan on the gas range and put the box in the pan.

"Are you going to fry it?"

"I'm applying the cleansing action of fire." Privalov turned the box over. "We'll just warm up all these rheumatic old joints." Humming all the time, he shook some tooth-powder into a saucer, poured water into it and stirred the mixture, then dipped a cloth in it and smeared the

sides of the box. The chalk hissed as it quickly dried on the hot metal.

Next Privalov dipped a dry rag in kerosene and squeezed out the rag above the box. The yellow drops were instantly soaked up by the chalk. Thin, clear-cut lines forming a severe geometrical pattern showed up, as though scratched on the box by a needle.

"It's put together with dowels, like a wooden box. The edges must have been caulked, and then the whole thing was polished. Kerosene on chalk will always show up a crack, no matter how tiny."

"You're not going to open it now, are you?"

"Oh, yes, I forgot. 'The Sorceress'." Privalov quickly tidied up the table and went off to wash his hands.

Boris Privalov entered the laboratory towards the end of the day.

"Do you remember the rusty iron bar I picked up at the bazaar that day?" he asked Nikolai and Yura. "Here it is, all cleaned up."

"Why, it's dowelled," said Nikolai, turning it over in his hands. "Must have been made ages ago."

"Let's open it," Privalov suggested. He went over to the bench and put the box into the jaws of a vise. With each tap of a hammer the dowels loosened, one side of the box rising at an angle. Another blow of the hammer, then still another, and one side of the box clattered to the floor. Three heads bent over the open box. Inside lay a white roll of cloth. Yura reached out to touch it but Privalov caught his arm. He cautiously

unwrapped the roll. Inside it were sheets of thin but strong paper.

The pages were covered with fine handwriting in letters that were hardly connected with one another.

"It's in a foreign language!" Yura exclaimed.

Privalov pushed his glasses up onto his forehead and looked down at the manuscript.

"Black ink", he said. "It wasn't written in this century. Ink isn't made out of nut-gall nowadays. From the way the letters are shaped they must have been written with a goose quill. And it's in Russian, although in the old-time spelling."

"An old manuscript!" Yura exclaimed delightedly. "Boris, we must get Val to read it for us. She's a philologist and her field is Old Russian."

"Could it be a last will and testament, I wonder?" Privalov said thoughtfully. He began to read, but it was slow work because of the unfamiliar spelling. The manuscript began as follows:

"I commence this epistle on the second day of January in the year of Our Lord 1762, desirous of passing on my thoughts and ideas to my beloved eldest son, Alexander.

"My youth was spent in trials and tribulations and wanderings, similar unto those of Homer's Ulysses. Upon attaining manhood I was often called away from home by duty, so that I seldom saw you, Alexander. After you entered the service I retired. Now I spend my days at home, and I see less of you than ever.

"As I await my last hour I have chosen this time to set down an account of matters to which

I have given much thought, and I place my hopes in you, for you are strong in the sciences.

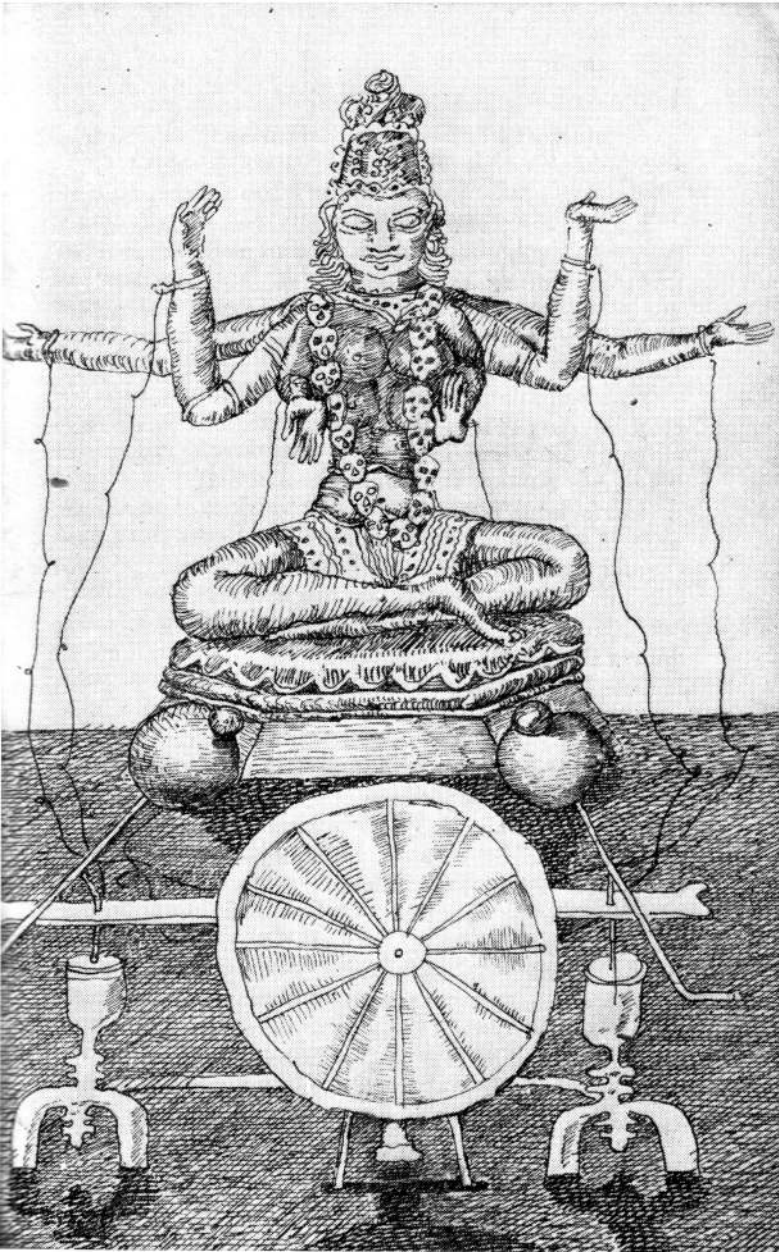
"I shall put down my story point by point, from the beginning, lest I should omit something. First, during the reign of our great ruler, Peter the Great, son of Alexis, eternally blessed be his memory, I was despatched on a long journey...."

2

NAVAL LIEUTENANT FEDOR MATVEYEV

Many the men whose towns he saw,
whose ways he proved;
And many a pang he bore in his own
breast at sea,
While struggling for his life and
his men's safe return.

Homer —THE ODYSSEY



CHAPTER ONE

WHICH TELLS OF THE CAMPAIGN OF PRINCE BEKOVICH-CHERKASSKY

Lieutenant Fedor Matveyev of the Russian Navy had gone through the same school as many another young nobleman who, by the will of Peter the Great, was torn away from his placid rural life and cast into the maelstrom of those turbulent times.

The School of Navigation in Moscow, instruction in carpentry, the wheel wright's craft and shipbuilding in Holland, the Louis Quatorze Nautical School in Marseilles, artillery training in Paris, and round-the-clock work in the shipyards of the new, cold city of St. Petersburg had turned the illiterate village bumpkin, pigeon fancier and church singer into a smart naval officer fluent in foreign languages and inured to the deprivations of a wanderer's life.

The indomitable will of Russia's extraordinary tsar had scattered these young men of a new mould far and wide.

Fedor Matveyev was not the least surprised when he received orders to join a hydrographic expedition on the Caspian Sea. He and young men like him had no time to be surprised—they were too busy surprising others.

When Fedor reached the Caspian town of Astrakhan his ears were still ringing with the roar of the battles on the Baltic Sea, and his right shoulder ached from a wound made by a Swedish falcon bullet.

He was struck by the quietness here. In contrast to the steel-grey waters and overcast skies of the Baltic, the Caspian Sea was green; it had yel-

low sandy beaches, a dazzling blue sky and a merciless southern sun.

The tsar's instructions ordered the expedition, which was under the command of Prince Bekovich-Cherkassky, "to search assiduously for harbours and rivers where ships might be put in and scout-boats find a haven during storms; to establish the location of sandbars and underwater reefs, and enter all these and other things on maps; to cross the sea and note the location of islands and shoals; to put the width of the sea on the map".

Fedor Matveyev enthusiastically set about mapping the unfamiliar sea. There was an ancient mystery about those uninhabited, windswept shores. Fedor knew that beyond the sun-baked yellow sands lay fabulous India.

He was unaware, as yet, that Prince Bekovich-Cherkassky's expedition had another mission, a secret one.

Finding the shortest trade route to India had long been one of Peter the Great's ambitions. He had heard much about that country's wonders and unbelievable wealth.

Indian goods reached Europe through Persian and Arab merchants. European goods flowed to India through the same hands. Yet, reflected Peter, Nature herself had decreed that Russia should be a middleman in the commerce between Europe and Asia.

On the route to India lay Khiva and Bukhara, troubled lands whose rulers were constantly engaged in strife. In the year 1700 Shah Niaz, Khan of Khiva, had expressed a desire to become a sub-

ject of the Russian tsar, hoping with Peter's help to bolster up his shaky throne. But then new rulers succeeded one another so rapidly in Khiva that it was impossible to keep track of them.

Everything was a mystery in that sun-scorched land.

For instance, old maps showed the Amu Darya flowing into the Caspian Sea. Herodotus, the Greek historian, and Arab historians also, said the Amu Darya flowed into the Caspian. Yet it was rumoured that the fickle river had shifted its channel. The rulers of Khiva, it was said, had built an earthen dam which caused the river to flow into the Sea of Aral.

What sort of river was this Amu, river of the Bull, known to the ancient Romans as the Oxus and to the Arabs as the Jihun? Peter the Great was aware that it rose somewhere in India. If it could be turned back into the Caspian, and if he, Peter, could be master of its banks, or at least live in peace and friendship with those who held them, India's rich commodities could be delivered down that river to the Caspian Sea, across the Caspian to the city of Astrakhan, and from there up the Volga into Russia—by-passing the Persian merchants. These Indian commodities would be cheaper, and, besides, Russia's treasury would profit.

Furthermore, Peter had heard there was gold in that area, near the town of Irket.

All these rumours must be verified. The area must be explored by trusty men.

Peter could not tolerate delay. Early in May 1714 he ordered Prince Bekovich-Cherkassky, a lieutenant in the Preobrazhensky Guards Regiment, to set out for the Caspian Sea with the men he needed, "to search for the mouth of

the river Amu Darya". On May 19 he ordered the Prince, in addition, "to proceed to Khiva and from there to Bukhara, to ascertain the possibilities of trade, and under cover of that, to find out everything he could about the town of Irket."

Before his conversion to Christianity Prince Alexander Bekovich-Cherkassky's name had been Devlet Kizden Mirza. He came from a line of Kabardian rulers. As a boy he had been stolen by Nogai tribesmen. He fell into the hands of the Russians when Russian troops under Vassily Golitsin besieged the town of Azov, and was taken into the home of Vassily's brother Boris, one of Peter's tutors. In 1707 he was sent abroad to study. Soon after, he married into the Golitsin family, taking Boris Golitsin's daughter, the Princess Martha, for his wife. When Prince Bekovich-Cherkassky joined the Preobrazhensky Regiment he attracted the tsar's attention. It was to this strong, courageous, well-educated young man with a knowledge of the East that Peter the Great assigned the difficult mission of finding a route to India.

On his way to Astrakhan, which he reached in August 1714, Prince Bekovich-Cherkassky stopped at Kazan, on the Volga. Here he took more than 1,500 soldiers and 19 cannon under his command.

The expedition set sail from Astrakhan for Guryev, a town on the Caspian, at the mouth of the Ural River, on November 7, and nearly perished at the very beginning of the voyage. A vicious autumn storm scattered the twenty-seven light Volga boats and two schooners. The battered flotilla limped back to Astrakhan one month later, at the beginning of December, without ever having reached Guryev.

After wintering at Astrakhan and obtaining about two dozen new boats, the expedition set sail again on April 25, 1715.

Prince Bekovich-Cherkassky stood on the weather side of the quarter-deck as his flagship emerged from the Volga delta into the expanses of the sea. The green waters of the Caspian now gurgled beneath the schooner's keel. The Prince stood there, lost in thought. He was only a little over thirty at the time, and the realization that he was responsible for so many men and so many ships weighed heavily on him.

He gazed in silence across the green vastness, wondering what awaited him beyond those deserted shores and the burning, shifting sands.

The flotilla cruised along the eastern coast of the Caspian until late autumn. It stopped at Guryev, rounded the Mangyshlak Peninsula and sailed southwards for a long time, mapping and describing in detail the strange, deserted coastline. The sun blazed down on them. The barrels of water taken on at Guryev became putrid; the men were tormented by thirst. But even stronger than thirst was the yearning for distant Russia, for shady forests and smoke rising from the chimney of one's own log cabin.

The flotilla sailed past a gap in the coastline through which the sea rushed noisily. This was the mysterious Gulf of Karabugaz, eternally covered with a dark haze of evaporation.

Then it sailed over a long, dangerous underwater spit that is now called Bekovich Bank. After rounding the bank it entered Krasnovodsk Bay, a place that slept the sleep of the dead amidst burning sands and hillocks.

In the autumn of 1715, one year after it had

first sailed out into the Caspian Sea, the flotilla returned to Astrakhan. The expedition had failed to reach either Khiva or Bukhara, and it had not learned anything about gold in that area. But it had confirmed the fact that the Amu Darya did not flow into the Caspian and that its old channel had dried up. Also, it had mapped the coast of the Caspian.

The expedition proved to be too small and unsatisfactorily equipped for a long, dangerous overland journey.

On February 14, 1716, Prince Bekovich-Cherkassky was given a new assignment. He was appointed Ambassador to the court of the Khan of Khiva with instructions to proceed to Khiva along the Amu Darya, carefully studying the river and examining the dam to see whether the river could be turned back into its old channel instead of flowing into the Sea of Aral. He was also to determine how many men would be needed to do that.

Rumour had it that Khan Shirgazy, who now ruled Khiva, was extremely hostile to the local princes and was eager to consolidate his power. Prince Bekovich-Cherkassky was instructed to persuade him to become a Russian subject loyal to the tsar by promising to help him to unite his domain. In return for putting a Russian regiment at his service the Khan would presumably act in the interests of Russia.

The Prince was also instructed by Peter to send an intelligence agent to Khiva disguised as a merchant to search for a water route to India.

By decree of the Senate the strength of the expe-

dition was enlarged to 6100 men in three infantry regiments, two dragoon units, two Cossack regiments, a marine detachment and a building crew. The building crew included men experienced in the construction of fortifications. The expedition also had scribes, interpreters, doctors and pharmacists.

The regiments and baggage-trains gathered at Guryev. Prince Bekovich-Cherkassky set out for Guryev from Astrakhan, accompanied for a short distance, as far as the Caspian, by his wife Martha and their children. A fishing vessel followed the flotilla to take her and the children back to Astrakhan.

Soon after they set sail the weather changed. A furious wind drove heavy waves against the current. The Prince bade his wife and children farewell, then stood for a long time watching the triangular white sail of their boat grow smaller in the distance. As he observed the clouds gathering above the Volga and listened to the wind howling in the rigging, he was filled with foreboding.

Before long the news reached Guryev that his wife and daughters had been drowned in the storm. Only his little son had been rescued.

When in the company of others the Prince tried to hide his sorrow. But the sight of him sitting alone in his tent, gazing fixedly into space, his face a picture of despair, was enough to wring the hardest heart.

At the end of May 1717 the expedition set out from Guryev for Khiva. There was a good road, and they had an abundance of water as well as

plenty of forage for the horses. The expedition was able to make up to fifteen kilometres a day across the salt marshes, and reached the Emba River in a week's time. There the men and the horses rested for two days, then built rafts and crossed the river.

Here the sands began. Following a caravan route, the expedition finally reached the blue Sea of Aral.

The men were tormented by the heat and by thirst. All around them stretched scorching sands. Time and again the expedition failed to reach the next well by nightfall. Slowly but surely it was moving towards its doom.

Fedor Matveyev found the march difficult. Although he had a good physique and endured the heat better than many of the others, a presentiment of disaster kept nagging at him. Outwardly, however, he was composed. He encouraged the weary and seemed to know just where to dig shallow wells during bivouacs. The water brought up was brackish but potable.

Finally the expedition reached Lake Aibugir. Now Khiva was only a few days' march away.

It had been assumed, when plans for the expedition were first laid, that Khan Shirgazy was a weak ruler, fearful of his subjects, and would eagerly accept an offer of Russian military aid. That was no longer the case in 1717. Khan Shirgazy had brutally suppressed an uprising and was now stronger than ever before. As the Russians approached Khiva he resolved to show his enemies just how strong he really was.

One morning a band of Khiva horsemen galloped into view from behind the hillocks along the lake shore. Brandishing curved sabres and fil-

ling the desert with war cries, they charged the Russian camp.

The attack failed because the sentries were vigilant and the camp was surrounded by a wall of carts from the baggage-trains. The attacking force had to dismount and lie prone. The exchange of fire lasted until evening.

During the night the Russians fortified their positions. They dug ditches on three sides of the camp and built an earthen rampart. The fourth side was the lake, which was thickly overgrown with reeds. They tied reeds into bundles and piled them together to conceal the batteries.

The next morning an army of 20 000 men—ten times more than the expedition had—led by Khan Shirgazy himself, surrounded the camp.

The siege lasted two days. The Russian cannon pounded away steadily; the men did not run out of either cannon-balls or vodka, and water for cooling the gun barrels was at hand. Heavy losses were inflicted on the attacking Khivans. Although the Prince's men were exhausted from their gruelling march they fought gallantly.

When Khan Shirgazy saw that he could not take the camp by storm he decided to resort to guile. To the astonishment of the Russians the besieging troops vanished during the night. Silence reigned over the desert.

The next day passed in tense expectation. Towards evening a lone horseman came galloping across the desert towards the camp. Wearing a richly-embroidered robe and turban, and with his hennaed beard, he was a colourful sight. When he reached the camp he introduced him-

self as Ishim Hodja, envoy of the Khan, and explained courteously that the attack had been made without the Khan's knowledge. The Khan, he said, had ordered the heads of the guilty to roll, and now invited the Prince to a council of peace and friendship.

The latter sent a Tatar named Useinov to tell the Khan that he, Prince Alexander Bekovich-Cherkassky, was an envoy of the white tsar, bearing credentials and many gifts, and that it would be to the Khan's great advantage to receive the Russian mission.

Khan Shirgazy received Useinov and asked him to tell the Prince that he would reply after he had consulted with his advisers.

He did consult with his advisers. They said it had been a mistake to withdraw from Lake Aibugir, for the Prince did not have many men and it was too early to resort to guile.

Soon the curved blades of the Khiva horsemen again glinted in the sun in front of the Russian fortifications beside the lake. Slender arrows and clay bullets glazed with lead again flew towards the camp. Again clouds of black smoke drifted across the desert as the Russian gunners, veterans of the war against Sweden, took aim and fired.

After beating off the attack Prince Bekovich-Cherkassky again sent his parliamentarian to the Khan to demand an explanation of this perfidious conduct.

Khan Shirgazy insisted once again the attack had been made without his knowledge. Again he declared that those to blame for the attack had already been caught and punished, some by death and others by a fate worse than death.

The next day Prince Bekovich-Cherkassky

himself rode over to the headquarters of the Khan for a talk.

The Khan received him graciously. He promised to order his men to tear down the dam on the Amu Darya. He promised to be a younger brother to Peter the Great. He pledged peace and love and he kissed the tsar's scroll.

The day was clear, with a fierce sun beating down mercilessly. All of a sudden the motionless air stirred, and a light breeze arose.

Dogs howled and horses neighed. The sheep which the Khan's men had brought along for a feast huddled together, bleating piteously.

A black smudge appeared on the disc of the sun. It grew rapidly, spreading across the sun. Darkness fell. Stars came out.

The Khiva men beat on tambourines and drums to drive away the demons that were trying to swallow the sun.

Khan Shirgazy was alarmed. Could this be a bad omen, just when he was about to sign a treaty with the white tsar?

An elderly mullah in a green turban stood on tiptoe, his goatee tickling the hairy ear of tall Khan Shirgazy. He whispered, a crooked finger pointing to the darkened sun, "Do you see the omen, oh mighty ruler?"

"I do," the Khan growled.

"The omen is shaped like a crescent. It signifies that the glory of Islam will eclipse the glory of the infidels."

This reassured the Khan. When the eclipse ended he accepted the gifts of the white tsar with a light heart. Examination of the gifts lasted until evening.

Then the Khan and the Prince mounted their

steeds and set out for Khiva, riding side by side. They were followed by the Khan's suite and the Russian expedition. The Russians, now in good spirits, sang as they marched along.

A short distance from Khiva the Khan and his men set up camp on the bank of a stream. The Russians pitched their tents nearby. Prince Bekovich-Cherkassky and his companion, Prince Samonov, were the guests of honour in the Khan's tent.

During supper the Khan explained to the Prince that it would be impossible to quarter the entire Russian mission in Khiva because there would not be enough food for them and it would take some time to bring in more supplies. Unless the Prince had plenty of his own provisions, in which case, of course—

Prince Bekovich-Cherkassky had to confess that he was running short of provisions. The Khan then suggested that he divide the Russian force into five units, each to be quartered in a different town where, he promised, the food and lodging would be of the best. Prince Bekovich-Cherkassky and his companions would, of course, be offered hospitality in Khiva itself.

It is hard to understand why Prince Bekovich-Cherkassky ever agreed to such a dubious arrangement. Perhaps he believed that Khan Shirgazy really had been frightened by the Russian artillery during the skirmishes at Lake Aibugir. Or he was so overwhelmed by his personal grief that he was unable to think clearly.

The Russian foot soldiers, dragoons and gunners marched off from the stream in five different

directions, each group accompanied by Khiva guides. The thick dust raised by the departing units hung for a long time in the hot, still air. Slowly the strains of their marching songs died away in the distance.

Prince Bekovich-Cherkassky stood in front of the Khan's tent, gazing after his men, oblivious of the Khivans who had crowded round him.

The units vanished from sight. The dust began to settle.

"You dog! Betrayer of Islam! You have sold your soul to the infidels!" said Khan Shirgazy softly, laying a hand on the Prince's shoulder. "You dog! You tried to deceive me with your miserable gifts!"

Prince Bekovich-Cherkassky spun round. Although he had difficulty understanding the Uzbek language he immediately grasped the meaning of the Khan's words. All he had to do was read the Khan's face.

Khan Shirgazy drew out the royal credentials from the sleeve of his robe. Slowly and solemnly he tore the paper in half, threw the pieces on the ground, spat on them, and rubbed them into the sand with the pointed, turned-up toe of his yellow boot.

Prince Bekovich-Cherkassky took a step backwards. He reached for his sword, then dropped his hand.

Smiling and chattering, the Khan's bodyguards drew closer, their swords bared.

Khan Shirgazy turned away. "Don't spoil the face," he murmured as he passed the bodyguards.

The heads of the senior Russian officers were brought to Khiva and displayed to the public.

Prince Bekovich-Cherkassky's head was not among them. Rumour had it that Khan Shirgazy had sent the head as a gift to the Khan of Bukhara, but cautious, far-sighted Abul-Faiz had refused to accept the horrifying gift and had sent it back.

The five Russian detachments were destroyed one after another. Some of the men were killed, others were sold into slavery. A few managed to escape, some during the fighting and others later, while in captivity. Only a very few managed to make their way back to Russia by various routes after enduring indescribable deprivation and dangers.

CHAPTER TWO

IN WHICH FEDOR MATVEYEV FINDS HIMSELF IN INDIA

When Fedor Matveyev opened his eyes he found himself lying beside a dusty road that ran through a tract of desert where only camel's-thorn grew. He groaned as the memory of that frightful day came back to him. Had it been yesterday, or the day before?

The pitiless sun, directly overhead, made his eyes ache. He felt weak and nauseous. There was a sharp, constant pain in his right shoulder.

When Fedor awakened again the sand, soaked with his blood, was cool. Enormous stars glittered in the black sky. His throat was dry.

Wheels creaked close by, accompanied by a monotonous, wailing song in an unfamiliar language.

"If they capture me I'll be tortured and killed," Fedor thought. "I must creep farther away from the road."

With an abrupt movement he turned over on his stomach, gave a sharp cry of pain, and fainted once more.

During the night he recovered consciousness several times. Each time he saw the same bright stars overhead and heard the creaking of wheels and the plaintive song. Added to these sensations was the feeling of being jolted and the acrid odour of sheep's wool and horse sweat.

Fedor had been found lying unconscious near the road by an Uzbek peasant named Sadreddin, who put him in his bullock cart and took him home. There he and his family nursed Fedor solicitously, using ancient remedies to treat his deep wound. Fedor's collarbone was broken—but young bones mend quickly. The wound was encouraged to fester and was not allowed to heal so that the pus could carry away the small fragments of broken bone.

After the fever subsided Fedor began to recover. He was given nourishing food and could feel himself growing stronger day by day.

What would happen next? Fedor could not but be worried. The peasant who had taken him in was a kind man but he could not help wondering how he could turn the presence of this infidel to advantage. The young Russian could help him in the fields, and he probably knew some handicraft which he could practise. But it would be impossible to hide a healthy young Russian for long. The Khan's men would learn about him sooner or later—and that would be the end of Sadreddin. Taxes were onerous as it was, and now he would be stripped of everything he possessed. He could let the Russian go free, of course. But where would he go to? Sadreddin grew angry

with himself. The faithful should never take pity on infidel dogs.

No, he had not fed and nursed the Russian to let him go just like that. He would find a different way out.

One night at the end of summer Sadreddin prepared a basket of provisions and put the basket and Fedor into his covered cart. Casting fearful glances to right and left, he drove through the sleeping hamlet.

He had not concealed his plans. Fedor knew that the kindly Uzbek was taking him to some place far away from Khiva to sell him.

"Are you a gunner?" he asked Fedor for the hundredth time as the cart rolled along.

Fedor, who had learned a little Uzbek, nodded.

"Can you do a blacksmith's work?"

Again Fedor nodded absentmindedly. He was wondering what to do. It would not be hard to overpower sluggish Sadreddin and take the horse and cart and food away from him. But what next? It must be all of 900 versts to Guryev. Travelling by cart it would take him a month to reach that city. But it would be risky to follow the road. On the other hand, setting out across the desert, without knowing where the wells were, would mean certain death.

Sadreddin knew that Fedor had no way of escaping, and so he travelled along slowly without taking any precautions.

They reached Bukhara in two weeks' time. There Sadreddin sold Fedor to a merchant from Kashgar for a good price. He spent the money on Bukhara merchandise.

"You have brought good luck to my house," he told Fedor in parting. "You fetched a good price.

If I can return home with these goods without being robbed, my family will live well. For this, Allah will help you, even though you are an unbeliever."

The swarthy Kashgar merchant, who had been told Fedor's history, laughed into his thick black beard. Poor Sadreddin thought the price he had been paid for Fedor made him a rich man. He had no idea of the true value of a strong young man who had been trained in the arts of warfare and metallurgy.

The merchant treated Fedor well, even giving him a horse to ride, for he knew that Fedor would not attempt to escape from the caravan. He also gave Fedor sheets of paper and a copper inkpot on a chain to hang at his belt. When the caravan set up camp for the night Fedor would take his pen, made of a split reed sharpened at the end, and, in a hand grown unaccustomed to writing, would describe the landmarks and details of the journey. In Astrakhan not so long ago he had envisioned his travels to distant India from Khiva to gather information about that country. Now he was actually on his way to India but as a slave instead of a scout of the tsar. Still, who could tell? These notes might yet prove useful.

Fedor had decided to conceal his homesickness and bitterness and bide his time.

It took the caravan three weeks to reach the mountains. For ten days they climbed higher and higher along a narrow path. It grew colder. Fedor's heart leaped with joy at the sight of snow, but it made him more homesick than ever for the snowy plains of Russia.

Finally they made their way over the pass and descended into the flowering Vale of Kashmir, following the river Gilgit to its confluence with

the Indus. They crossed the Indus and some of its tributaries. Several weeks later they entered the city of Amritsar, a big commercial centre.

So this was India! It was a land of strange buildings, unfamiliar trees, colourful bazaars and copper-skinned people, some half-naked, some dressed in white robes. Fedor drank in the marvellous sights with unfeigned curiosity.

The Kashgar merchant decked Fedor out in new clothing and gave him an opportunity to rest up. But at the inn he locked Fedor into his room and ordered the servants to guard him, not so much because Fedor might escape as because someone might try to steal him.

One day the merchant brought a tall, thickset Hindu, all dressed in white, to see Fedor. The Hindu looked him up and down intently, then smiled and seated himself cross-legged on a carpet, making a sign to Fedor to be seated too.

During the years he spent in the East Fedor adopted many of the customs of the region, but nothing was harder for him to learn than to sit on the floor in Indian fashion, with the soles of his feet lying on his thighs.

"*Sprék je de Néderlandse taal?*" the Hindu asked.

Fedor was amazed to hear him speak Dutch.

"You have nothing to worry about," said the Hindu. "If what the merchant says about you is true you will have a fine life."

The Hindu then proceeded to question Fedor. He asked him about dams and water wheels. They discussed European politics and Russia's war with Sweden. Fedor was surprised to find himself conversing with a highly-educated man.

Finally the Hindu turned to the Kashgar merchant. Although Fedor did not understand a word

of what they said it was clear they were bargaining. This went on for a long time. At times the merchant, accustomed to bazaars, would raise his voice to a scream. The Hindu kept his voice low but firm. Then there came the moment when he unwound his broad sash and removed a small purse and scales with a single tray and a weight suspended from an ivory rod. From the purse he took two precious stones that sparkled with greenish lights. He dropped the gems into the tray, and, holding the loop of the ivory rod in his left hand, he moved the weight along the rod with his right hand to balance the scales.

The Kashgar merchant looked at the mark at which the weight stopped, then carefully picked up the stones and examined them, first one and then the other, against the light. He bowed respectfully and without saying a word started unwinding his sash to put the jewels away inside it.

"You can see how much you are worth," the Hindu remarked in Dutch.

Fedor did not like the idea of being sold for such a high price. He knew little about precious stones but realized that if he were ever ransomed the ransom would be high. His family was not rich. They would hardly be able to raise such a sum. The tsar had seen him only once or twice and probably would not remember him. If the Foreign Board were asked to pay a ransom, would it consent?

"Now fortify yourself with food," the Hindu said to Fedor. "There is not much time and we have quite a distance to travel."

A servant at the caravansarai brought in a bowl of rice and mutton similar to the Uzbek pilau,

and a pitcher filled with a cold liquid. Fedor and the Kashgar merchant set about their meal. The Hindu rose and moved towards the door.

"Why doesn't he have something to eat too?" Fedor asked in a low voice.

"Sh-h," the merchant whispered. "He's a Brahman. They never eat with other castes. Besides, they don't eat meat and many other things."

"Who is he?" Fedor asked.

The merchant's reply was vague. "He must be an important person. All I know is that his name is Lal Chandra and he comes from the Punjab, not so very far away from here."

By evening Lal Chandra's covered wagon was some distance from Amritsar. The driver, bare to the waist, urged on the horses. Lal Chandra dozed, reclining against rug-covered cushions. Fedor lay on the floor of the wagon, his thoughts far away, in distant Russia.

They drove through Lahore and then followed the bank of a river. Afterwards they turned west and rode for a long time across a desert tract that looked like the land in the vicinity of the Sea of Aral. They crossed the beds of dried-up rivers. They followed the bank of one of these streams and finally halted in front of an iron gate in a high stone wall.

The gate swung open to allow the wagon to pass through, then swung shut. Fedor looked out but he could see no one beside the gate. Nor was there anyone on the long road that wound through a park in which unfamiliar trees grew. The hot air was filled with a heady fragrance, evidently from the big, bright flowers. The wagon stopped before a tall stone mansion with many niches in which stood strange creatures carved of stone.

Lal Chandra slowly descended from the wagon. Fedor sprang out after him, stretching his stiff legs. Lal Chandra led him along a narrow, vaulted, dusky passage into a large cool room where a big statue of polished stone stood. Fedor had never seen anything like it, not even in his most horrible nightmares. Three steps led up to a low pedestal on which sat a woman with her feet tucked under her. Her face was unbelievably beautiful, her eyes were blind, and her lips were curved into an enigmatic, frightening smile. The woman had six arms. Two arms ended in hands folded peacefully in her lap, two were bent at the elbow and raised, and two were thrust forward menacingly. She had three pairs of breasts.

Lal Chandra placed the palms of his hands in front of his face and prostrated himself before the statue. He remained motionless for a long time.

"He obviously isn't Moslem," Fedor thought, "if he is praying to this idol."

Finally the Hindu rose and bowed three times before the goddess. Then he led Fedor into a small room that resembled a monk's cell, with bare stone walls and a vaulted ceiling. Slanting rays of sunshine coming through a window near the ceiling provided the illumination. In the floor was a pool filled with water, evidently running water.

"I do not know whether your gods prescribe ablutions," said Lal Chandra, "but I must purify myself before attending to my affairs. You may, too, if you wish."

Fedor promptly removed his clothing and sank with pleasure into the cool water. He began to splash noisily, not noticing the Hindu's frown.

After the ablutions Lal Chandra led Fedor along another passage into a large, bright room with windows looking out on a garden. The windows did not have either glass or mica in them but were covered by intricately carved shutters with interstices through which the light came. Here, too, there was a statue of the six-armed goddess. Smaller than the first one, it was made of copper and stood on a high marble support.

Low tables lined the walls. The shelves above them were filled with fancifully shaped glass, clay and metal vessels, scales, sandglasses and water clocks.

In a corner there was a stove. The curved necks of copper vessels jutted out of its sides.

Fedor's attention was caught by a monstrous object on a platform in the middle of the hall, opposite the statue of the goddess with six arms.

Moulded copper columns, ornamented with carvings of plants and animals, supported a horizontal shaft whose necks rested on copper wheels half a foot in diameter. An enormous disc of some black material was mounted in the middle of the shaft. It was covered with radially distributed plates, narrow and shining, that might have been made of gold. At one end of the shaft was a pulley encircled by a round, woven strap. The ends of the strap went into openings in the floor.

Fedor stood in front of the bulky machine trying to grasp its purpose. He had never seen anything like it before.

"It pleases me to see that here you have forgotten about contemptible food," Lal Chandra said, touching Fedor on the shoulder. "But man is weak. Pass through that door"—he pointed to a narrow opening in the wall— "and you will find

the kind of food to which you are accustomed. Then you will learn what you are to do."

In the small adjoining room Fedor found a bowl of fried meat and steamed vegetables on a low table. A narrow-necked pitcher stood on the floor. There was no chair. "I suppose I'll have to get used to it," Fedor said to himself with a sigh as he awkwardly squatted down beside the table.

CHAPTER THREE

WHICH DESCRIBES THE LIGHTNING MACHINE

The days in Lal Chandra's house passed slowly. Fedor wandered through empty corridors and peeped into cool rooms. He never saw anyone in them. But he knew that he had only to strike a bronze gong for a silent servant to appear on the threshold.

The food was plentiful, but it brought Fedor no joy. He wanted to go out beyond the wall to see what the locality looked like, but each time he came to the gate he found it locked. Escape was impossible. Besides, Fedor was hunted by the feeling that someone was watching his every step.

On the other side of the filigree shutters lay an alien night. The silence was absolute. He longed to hear a sound, any sound, even the barking of a dog. At times he was driven to such despair that thoughts of laying hands on himself came into his mind. Cry out though he might, Russia would never hear him. She was too far away, beyond high mountains and scorching plains.

Fedor shook the shutters in fury. He pressed his tear-stained face to the cold metal.

Lal Chandra visited him almost every day. He would enter, tall and erect, in his white robe, and conduct a vague conversation on theological topics. These talks made Fedor uncomfortable. At home he had never prayed with any particular fervour and he had never had the time or inclination to go into the subtleties of religion. He had felt that it was enough if he, as a soldier, crossed himself before climbing into bed.

One day he was unable to restrain himself, and in the midst of Lal Chandra's monotonous utterances he burst out: "I'm sick of all this dull talk. You bought me to work. Well, give me something to do."

Lal Chandra was silent for a while. "Soon," he said, "I shall raise before you the veil that shrouds a holy mystery which the gods reveal only to the chosen."

"Couldn't your gods find anyone else but me?" Fedor asked derisively.

"Do not speak thus of gods about whom you know nothing. Only I possess knowledge of this mystery. You will be my assistant. You are a foreigner, without friends or relatives here, and therefore you are less dangerous to me than a fellow tribesman."

"If I am initiated into this mystery you will not allow me to return home when the opportunity comes. I don't want to know it."

"It will be of no use to you at home. It is important and awe-inspiring only here," Lal Chandra replied evasively. "But you must not speak about it to anyone. If you do, yours will be a horrible death." With those words he walked out of the room.

Fedor stood motionless for a long time, lost in gloomy thought.

The next evening Lal Chandra softly entered Fedor's room and sat down beside him.

"Which deity did you worship in your country?" he asked.

Fedor was at a loss. "The Holy Trinity," he wanted to say, but he could not find the words in Dutch. "I believe in the holy three," he said.

"Three gods—The Trimurti," Lal Chandra repeated thoughtfully. "Do your gods work miracles?"

"Of course they do. The Bible tells how Jesus Christ, the son of God, turned water into wine and raised Lazarus from the dead. Then there's the story in the Old Testament of a bush that burned but didn't burn up."

"Have you ever seen a miracle?"

"No, never."

"Now listen carefully, young man," Lal Chandra began. "When the gods do not work miracles, men tend to forget that they must obey the high priests implicitly. But we are not given to know why the gods fail for a long time to remind us of themselves."

"Are you a priest?" Fedor asked in surprise.

"I am but a humble servant of Kali, the Coddess of Terror. I have been chosen to be her instrument, so that men of the lower castes should be convinced, through miracles, of the might of the gods, and resign themselves to their lot of obedience and toil. As for our rulers, when they see a miracle they will realize that they must obey the high priests. Do you understand me, young man?"

"You mean that if your gods don't work miracles you'll—"

"Exactly. The gods, who have unveiled a small part of their mysteries to me, may work miracles through me. For the gods are all-powerful. Come with me. I will show you signs of their might."

Picking up a clay lamp, Fedor followed Lal Chandra into the big room in which the strange machine stood. Lal Chandra clapped his hands thrice and then issued an order to the servant who silently appeared before him.

The huge black disc rumbled as it started to rotate. Creaking, the woven belt emerged from the floor and passed over the pulley.

"Are men down below turning it?" Fedor asked.

Lal Chandra nodded. The disc spun faster and faster. Its gold plates merged into a glowing ring. A high-pitched hum filled the room.

Next Lal Chandra turned an ebony lever, and two sparkling bronze spheres that were part of the machine drew closer and closer together. Suddenly there was a dry crackle as a streak of bluish-violet lightning flashed between the sphere. The air felt fresh and cool, as after a thunderstorm.

While Fedor watched in fascination, lightning blazed in the dusk-filled room. He felt his skin creep.

With a turn of the lever Lal Chandra separated the spheres. The lightning ceased.

Lal Chandra gestured towards the bronze statue of the six-armed goddess.

"Do not be afraid of the goddess. Embrace her."

"Horrible creature," Fedor muttered in Russian.

"Are you afraid?"

Fedor boldly put his arms around the bronze

hips of the goddess. In the same instant he was deafened and stunned, and flung to the floor. Crackling lightning had sprung from the body of the goddess. A wave of freshness struck his nostrils.

Fedor regained his feet, cursing roundly.

"Forgive my little joke," Lal Chandra said, his lips parting in a smile. "I simply wanted to show you the power which the goddess has given me over lightning."

Fedor became aware of an itching sensation in the palm of his left hand. Looking down, he saw a cut at the base of his thumb.

"Your goddess bites, damn it!" he exclaimed. He was trembling.

Lal Chandra smeared a fragrant salve on the cut and the pain subsided.

"Now you will learn the purpose to which you will be put," he said. "I have heard that the art of building water-wheels is well known in your country. Is this art known to you?"

The covered wagon, driven by the same half-naked coachman, travelled across a barren tract for a long time before it came to a rocky road that led to the bank of a small stream.

Lal Chandra stepped out of the wagon and Fedor sprang down after him. They pushed their way through thickets until they reached the high bluff. There, squeezed between rocky banks, the stream was very narrow and formed a swift waterfall. Below the waterfall the stream was placid.

"Would this be a good place for a water-wheel?" Lal Chandra asked.

"Yes, a very good one," Fedor replied. "But does the stream flow all the year round?"

"No, it dries up in summer. Anyway, we won't need it long, only during the rains. Take the measurements you'll need to build a large wheel here."

Fedor looked round. On the other side of the stream, not far away, stood a temple-like building with two towers.

"Will we be able to approach that temple later?" he asked. "I'll have to if I'm going to take measurements."

"Of course. That temple is where the will of the gods is going to manifest itself."

"Very well," said Fedor. "I'll get my sight-vane."

He went back to the wagon for his instrument, a shallow wooden bowl with two tiny notches on the edges, diametrically opposite one another.

Picking up a clay pitcher and the sight-vane, Fedor approached the spot where the water cascaded over the lip of the rocks. He placed the bowl on a flat stone, filled the pitcher with water, and poured water into the bowl until it was almost full. Then he lay down on the ground and turned the bowl in front of his eyes so that both notches were in line with one of the towers of the temple. By pouring more water from the pitcher into the bowl, and carefully propping up the sides of the bowl with stones, he forced the water to swell above the edges of the bowl. Then, closing one eye, he concentrated on getting the nearest and farthest edges of the bowl to coincide in height. Holding his breath lest he get out of line, he counted: the water level was six rows

of stones below the windows of the second storey of the temple.

Then Fedor rose, rubbed his numb elbows, scrambled up the rocks to the top of the waterfall, and repeated his observations there, after which he descended to where Lal Chandra was waiting.

Next the two men waded across the stream and entered the abandoned temple. Ahead of them strode the coachman, Ram Das, carrying a torch.

Bats flitted about under the vaulted ceiling. The flapping of their wings nearly extinguished the torch. The air was damp and had a musty smell.

"Any snakes here?" Fedor asked.

"You won't find cobras in damp, dark places," said Lal Chandra. "But we are in the hands of Shiva and Kali."

The passage led into a room whose ceiling was so high that the light from the torch did not reach the top. The sides of the room faded into terrifying darkness.

On a three-tiered pedestal stood Fedor's old acquaintance, the goddess Kali, with her six arms, three faces and six breasts, wrathful, inscrutable and ready to act. The face that was turned to Fedor gazed across the room with a strange expression in which an inviting smile was combined with a threatening frown. The gaze was fixed on an equally enormous statue, with four arms, standing on one leg, the other being bent at the knee, in a dancing posture. This was the god Shiva, Kali's spouse.

Lal Chandra prostrated himself before the menacing goddess.

"What a handsome couple you make!" Fedor whispered to himself jokingly in an effort to regain his composure. He was in the grip of a fit of shivering caused either by the dampness or by the eerie atmosphere of the place.

He glanced at Ram Das. As the driver stood there holding the torch his face expressed neither fear nor religious devotion. He simply looked bored. There may have been a trace of scorn in the look the half-naked slave gave his master, Lal Chandra, lying prostrate before the sovereign over life and death.

The expression on the slave's face sobered Fedor. He resumed his scrutiny of the goddess. Suddenly he startled in horror. From her graceful neck hung a chain of human skulls.

"The foul murderess!" he exclaimed in Russian. Ram Das did not understand the words, but the wrathful tone prompted him to level a long, thoughtful glance at Fedor.

A few minutes later Lal Chandra led Fedor through a series of intricate passageways to the stairs leading up into one of the towers. Fedor climbed up the weathered, sand-sprinkled steps to the ninth storey. Looking down from a window, he saw Lal Chandra at the foot of the tower. Fedor took out his length of string, in which he had tied knots at intervals of one foot, attached a stone to the end, and began paying out the string, counting the knots. When the stone reached the sixth row of bricks below the second-storey window Lal Chandra gave a shout. Fedor stopped paying out the string, leaned far out of the window, and saw that the row of bricks he had noticed when he made his second measurement was at the seventy-fourth foot.

"That means the waterfall is seventy-four feet high," he thought. "I wonder how far it is to the ground."

He allowed the string to run out until the stone at the end touched the ground. The distance was about ninety feet.

Fedor now forgot about everything but the unusual and interesting job ahead of him. He was in such high spirits that when he descended and saw the silent torch bearer he clapped him on the shoulder. "We'll make a wonderful wheel!" he exclaimed happily.

Ram Das moved forward without a word. But after taking a few steps he stopped, glanced round, lifted his torch high to illuminate everything around them, and then gestured to Fedor.

"Do you understand what I say?" he asked in a Moslem dialect.

"I do," Fedor replied in Uzbek.

"Do not rejoice like a new-born calf. You will live just as long as you are needed to finish this job. Do you understand that?"

A shudder ran through Fedor.

"But what can I do? How can I escape?" he asked tonelessly.

"It is too early to talk of such things. I will find a suitable time and place to talk with you. But now, silence!"

The torch-bearer moved forward. A few minutes later they emerged into the bright sunshine. Ram Das threw the torch, which had burned low, into the stream. The flame hissed and went out.

Lal Chandra smiled at Fedor.

Man is a strange creature. Sometimes Fedor

would wake up in the middle of the night and, recalling Ram Das's grim words, give way to despair. But when morning came his fears would evaporate, whether because of his carefree Russian nature or because he was carried away by the work.

As he sat over the sketches and calculations of the huge water-wheel he sang to himself. At times these Russian songs were sad, at times they were gay.

Now the days passed more quickly. Fedor learned to speak the local dialect. Lal Chandra often travelled to the old temple to supervise the restoration work that had been begun there. Fedor was no longer alone behind the high wall. The courtyard was now filled with artisans busy fashioning parts for the wheel under his direction.

The courtyard had been turned into an open-air workshop, with forging furnaces and a copper-smelting furnace. In the middle of the yard the contours of a giant wheel seventy-two feet in diameter had been traced on the hard-packed ground, as at a shipyard.

Sometimes Fedor actually felt as though he were in the shipyards or in the courtyard of the Smolny palace at St. Petersburg, except that here there was none of the joking, bickering or singing characteristic of Russians at work.

Carpenters were making parts of the rim and the buckets of the wheel. The swiftly falling water would turn the wheel, which would convert this simple, comprehensible form of energy into another form, into mysterious, darting lightning.

The gigantic rim was made of the finest hardwood. Copper and iron bindings fastened the joints.

Once grey-bearded Jogindar Singh, the foreman of the carpenters, came up to Fedor. The two men communicated in an incredible mixture of Uzbek, Indian and Dutch.

"I want to ask you how thick the wheel axis will be," said the carpenter. As Fedor started to explain, a graceful girl in a sky-blue sari that left one shoulder bare approached them. The girl said something to Jogindar Singh that Fedor did not understand, gave Fedor a fleeting glance of curiosity, and ran off.

"It is now noon," said Jogindar Singh. "My daughter has summoned me to dinner. May we have the honour of your company?"

Fedor agreed eagerly. He wanted a chance to talk to that quiet, understanding man. Also, he wanted another glimpse of the girl.

Lal Chandra's workmen lived near the workshop, in tents set up among the trees in the big garden. They lived here with their families since they had no right to leave the premises until the job was finished. Each family prepared its food over a fire in front of its tent.

On the way, Jogindar Singh and Fedor washed their hands in a large pool of running water.

As they entered the tent the girl uttered a low cry and ran out. After a moment she returned carrying a black lacquered tray covered with bright flowers, and placed it on a mat spread on the floor. On the tray lay a mound of boiled rice over which a fragrant spicy sauce had been poured.

Then the girl brought in hot flat cakes and

a brass pitcher of cold water mixed with the slightly astringent juice of a fruit unfamiliar to Fedor. The girl moved lightly and quickly. She sat down beside her father, and Fedor looked at her dark, slanting eyes and thin brown arms. She dropped her eyes.

Jogindar Singh settled down to his dinner. Fedor also dipped his fingers into the rice.

"I thought you Hindus weren't supposed to eat in front of other people," he said.

"That rule is followed by those who divide people into jaties, or castes," said the elderly carpenter.

"To which caste do you belong?"

"I'm a Sikh and so are all the others working here," said the carpenter, gazing intently at Fedor. "We do not divide people into castes."

"Does that mean you do not recognize Brahmans?"

"We do not believe in future reincarnation," Jogindar Singh replied evasively.

"Just who are you? Moslems?"

"No."

It was obvious that the carpenter did not want to answer his questions, so Fedor ate in silence. He washed down the rice with water from the pitcher. From time to time he stole glances at the girl, wondering how old she was. He decided she could not be more than eighteen, and he was just about to ask what her name was when her father began to speak.

"Look here, foreigner. I do not know how you came to the Punjab but I can see it was not because you wanted to."

"Wanted to?" Fedor laughed bitterly. "I was sold, like an ox."

"Do not put your trust in Lal Chandra," the carpenter went on. "He is your enemy. He is our enemy too."

"Then why do you work for him?"

"We work for him because— Listen, we Sikhs were forced off our land. Everything was taken away from us." Jogindar Singh's eyes glittered angrily. "But that is not for long! We Sikhs will gather our forces—"

The light pouring through the entrance to the tent was suddenly cut off. Fedor turned round to see Ram Das standing there.

"You've found a suitable place for such talk, old man," the coachman remarked derisively.

"There are no strangers here," the carpenter replied quietly. "Only our brethren live in the garden."

"In the garden! That damned house is full of Lal Chandra's spies," Ram Das said as he squatted beside the tray of food.

Fedor looked at the coachman's frowning, sharp-featured face and again, as in the temple, a chill ran down his spine.

"Foreigner, you are as trusting as a child," Ram Das said. "Lal Chandra has given you a nice toy to play with and you forget that your end is near."

Fedor paled. "What can I do?" he asked. "As long as I am building the wheel no one will touch me. Afterwards, if I have to, I'll stand up for myself."

"No one is going to challenge you to a duel. You don't know the customs of the Brahmans. Instead of dying a useless death why do you not remain alive and help us? Jogindar Singh,

send your daughter out of the tent. She must not listen to the talk of men."

The Punjab was an arid semi-desert in the north-western corner of fabulous, fertile India. It was inhabited by stern, warlike men who passed their lives in a grim struggle against drought in order to earn an austere living for themselves and a life of luxury for their rulers.

The Punjab, along the border, had the most extensive trade contacts with other countries and was the part of India that was most often invaded. Alexander the Great's weary warriors came to the Punjab in the year 327 B. C. Later the region was invaded by the Persians and the Afghans.

The Punjab, accustomed to foreigners, to foreign merchants and to foreign conquerors, became the centre of the Sikh community.

Sikhism was a monotheistic religion that rejected castes, mortification of the flesh, priests, temples and public worship. The Sikhs wanted a better life in this world, and did not believe in reincarnation.

Shortly before Fedor Matveyev landed in the Punjab, the Sikhs had risen up against the subahdars, Moslem viceroys of the Mogul dynasty, and the local feudal rajahs. The uprising had been drowned in blood, with mass executions.

Although the Sikhs had suffered defeat and bitter losses, and had been deprived of their lands, they had not lost heart. Feigning submissiveness, they gradually gathered forces for another uprising.

Those were troubled times in the Punjab. The dynasty of Great Moguls was clearly on the wane. The Punjab rajahs, whom Lal Chandra served, were preparing to seize power from the weakened hands of the Mohammedan rulers. But the blood-stained spectre of another Sikh uprising haunted the rajahs and Brahmans. As a counter-measure they prepared to work miracles that would distract the people from the sobriety of the Sikh religion, convince them of the might of the old Hindu gods, and persuade them to resign themselves to obeying Hindu rulers.

The Brahmans had long possessed a variety of miracles demonstrating the power of their gods. The miracles were performed by wandering fakirs, ascetic wonder-workers and hypnotizers of wide experience. They tortured themselves in public by driving needles into their bodies, walking barefoot over burning coals, and allowing themselves to be buried alive.

The idea behind it all was that man can endure whatever trials life may bring him.

But it had become difficult to astound the grim people of the Punjab with the old, familiar miracles in which fakirs pierced their bodies, charmed snakes or turned themselves into towering palm-trees.

That was why Lal Chandra was preparing new miracles of a kind never seen or heard of before.

Fedor Matveyev had plenty to think about.

At home, in Russia, he had known that their family owned some two dozen peasant households,

that those peasants belonged to his father. The house in which the Matveyevs lived was much like a peasant's hut, while the family's food differed from that of their peasants only in that there was more of it. However, the lighting in the Matveyev home came not from splinters but from tallow candles, which, true, his frugal mother insisted on using sparingly.

The Matveyevs occupied the best pews in the tiny church, and Father Pafnuty never missed an opportunity to sing the praises of the Matveyev family in his prayers.

Tallow candles and prayers did not, of course, matter so much as having a familiar, stable way of life. Father owned the peasants. The peasants ploughed, planted, reaped and threshed the grain, and then brought it to the barn of their owner. Thus it had been for centuries, and thus it would always be. There had always been masters and there had always been slaves.

But now, in a foreign land, Fedor was himself a slave. Not a slave like the servants of Lal Chandra, true, but still a slave. When Ram Das openly urged him to take the side of the Sikhs, Fedor was thrown into the greatest confusion.

He recalled his father's stories about the peasant uprising under Stepan Razin, which had so terrified the big landowners. Now Indian peasants were planning the same thing against their masters and, besides, against their gods. How could a man who belonged to the nobility think of making friends with rebels?

For that matter, Ram Das was a fine one, pretending to be a humble slave! He was, Fedor guessed, practically the leader of these Sikhs.

The Sikhs had placed their trust in him. They had told him that an uprising was planned for the day the Brahmans arranged a festival to celebrate restoration of the temple of the goddess Kali. The Sikhs had told him that he must help them.

But how could he bring himself to help rebels?

Besides, what if they were lying when they said that as soon as he finished his work on the water-wheel he would be killed? What if they were simply trying to frighten him?

Should he go to Lal Chandra and tell him the whole story? No, he couldn't do that either.

There was no one to advise him.

Fedor's soul was in turmoil.

CHAPTER FOUR

IN WHICH FEDOR MATVEYEV IS PRESENTED WITH A KNIFE

Jogindar Singh asked Fedor to come to the smithy with him.

"Kartar Sarabha wants to make you a gift," he said.

Thickly-bearded Kartar Sarabha, the blacksmith, smiled broadly. "You have taught me many useful things that I did not know. In gratitude I want to make you a present of a knife. A man should not go about unarmed. I'll work while you look on."

This, Fedor realized, was a sign of great trust in him, a foreigner. Craft secrets were being shown to him.

The blacksmith picked up a bunch of short wires and sorted them, bending and unbending

each one. Fedor noticed that some were made of soft iron and others of firm steel. The steel wires were hard to bend.

After making his selection and tightly tying the ends together, Sarabha heated the middle of the bunch in the forge and tied it neatly into a knot. Then he heated it again and began to hammer it with rapid but careful blows. The wires were welded together into a bar.

After a few more heatings the blacksmith began to pound with all his might.

"Come tomorrow before dinner. We'll finish it," he said, tossing his tongs into a trough of water.

The next day Fedor was presented with a blade that had been polished and fitted into a handsome ivory handle. Examining the knife, he gave an exclamation of surprise. Smoky ornamentation with wavy lines ran the length of the bluish-grey steel blade. This was Indian damask steel, famous for its hardness and elasticity.

Fedor found himself drawn more and more often to the tents of the Sikhs. He liked these plain, stern men with whom he could talk frankly. Most of all, he was drawn to Bharati, the daughter of the grey-bearded carpenter. Bharati giggled when Fedor tried to converse with her in a hodge-podge of languages. She was merry and bubbled with life, unlike the people around her.

On stifling evenings Fedor and Bharati sat by the side of the pool, dangling their bare feet in the cool water. Fedor would absentmindedly launch into a long story in Russian. The girl

listened intently, her dark head bent and her big eyes glowing.

He told her about his distant homeland with its forests and snow, and rivers whose waters turned white and hard as stone in winter. He talked of great ships with tall masts and white sails taut in the wind, and the thunder of the cannon at Hangö-Udd. Of the green meadows in spring, and the song of larks high in the blue sky.

Did Bharati understand him? Probably she did, for it was not the words that mattered.

From time to time she gave Fedor a sidelong glance. In the starlight his face with its turned-up nose, his fair hair tossed back, and his brown beard, soft and curly, made him look, in her eyes, like a god of the North. She knew that in daylight his eyes were as blue as the water in the ocean.

When Fedor caught himself speaking Russian he fell silent in confusion, then shifted to his usual gibberish. Bharati laughed, splashing her brown legs in the pool, but then she would suddenly stop splashing and sit in silence for a long time. Or else she would start telling Fedor, in her West Punjab dialect, about her life, about the travels with her father, about the winter monsoons that blow from the land and the summer monsoons that blow from the ocean and bring rain, about the hot deserts and the swampy jungles.

As Fedor listened to the half-understood words pronounced in a high-pitched, flute-like voice, he gazed at the girl's dark, elongated eyes, the black braids hanging over her shoulder, and her strong, slender arms.

Now Fedor got down to designing the big lightning machine that would be placed in the temple of Kali. He still knew nothing about the terrible force that had thrown him to the ground that day. He remembered that jolt as a combination of the cold bronze hips of the goddess Kali, the crackle of blue lightning, the smell of a thunderstorm, and the sensation that his body was being pierced by thousands of needles. The instant of pain was followed by a strange shivering and a metallic taste in his mouth.

Fedor understood that neither the six-armed Kali nor any other deity had anything to do with shafts and gears. It was just that the Brahman knew something which others did not know.

The mysterious force, as Fedor now realized, was produced by the revolving of the disc, and it could travel anywhere along metal. Lal Chandra knew how to accumulate that force in metal vessels filled with a liquid; the bronze statue of Kali was hollow and filled with the same liquid.

Fedor was dying to learn the Brahman's secret and carry it home to Russia with him. He did not yet know how to discover the secret, or how to escape afterwards, but he was already wondering how he could get to see the tsar and tell him about the supernatural force.

Sometimes Lal Chandra burned spices and gums in a bowl standing on a tripod, from which came odorous smoke, while Fedor helped him to move the bronze spheres of the machine together and apart. Different spices produced different kinds of lightning, from very weak flashes

to streaks that leaped across a wide gap between the two spheres.

The smell of the burning spices and gums reminded Fedor of incense and church, there was something godly about it. But sometimes there was such a stench that even intrepid Lal Chandra covered his nose, extinguished the fire in the bowl, and aired the premises. Such a stench could not, naturally, be associated with divine guidance.

Fedor realized more and more clearly that Ram Das was right and that Lal Chandra was contemplating some evil deed. He was not calling forth lightning for the sake of science, or burning his infernal spices merely to glorify his many-armed idols.

One day the corpse of a middle-aged man, thin but well-built, was brought into the laboratory on a stretcher. A table with a heavy black marble top was placed beside the lightning machine. Two thick, flexible cables woven of bronze wires were attached to the bronze spheres. Bands of thin silk soaked in a resin of some kind were wound round the cables. Needle-sharp silver tips were soldered into the free ends of the silk bands.

At a sign from Lal Chandra the servants placed the naked corpse on the marble top of the table and silently vanished.

Lal Chandra threw a pinch of spice into the smoking bowl on the tripod. Greenish clouds of smoke filled the room with a pungent odour.

Next the Brahman picked up one of the cables.

"Take the other but be careful not to touch the tip," he told Fedor.

The disc of the lightning machine revolved

faster and faster. The gold plates merged into a glowing arc. The room was filled with a monotonous humming.

Fedor held the cable with both hands, the sharp-pointed end sticking out like a spearhead. Lal Chandra slowly moved his sharp end of the cable towards Fedor.

There was a crackle as a blinding streak of blue lightning leaped between the two ends. A spectral light illuminated the clouds of green smoke. Fedor stood perfectly still. He was accustomed to flashes of lightning. Lal Chandra swept the end he was holding to one side, and the lightning, with a final crackle, ceased. Still holding the cable, he went over to the marbletopped table and pulled off the cloth covering the face of the dead man.

Fedor gave a start of horror. The face was a terrifying bluish-white. The tip of the tongue protruded between convulsively twisted lips. The wide-open glassy eyes held an expression of terror. Round the neck ran a blue furrow—the clear mark of a woven noose.

Fedor at once remembered the Sikh stories of the abominable sect of thugs. Their "sacred" nooses hidden beneath their robes, members of the sect roamed the highways and the city streets in the evening, lying in wait for victims. Holding the noose by the ends in both hands, the thug crept up from behind, threw the noose round the neck of a lone passerby, twisted it into a knot in a quick movement and, thrusting a knee into the victim's back, pulled the noose tight.

This was done to propitiate the wrathful goddess Kali.

Fedor had also learned from the Sikhs that such thugs had never appeared in the Punjab, where the cult of the terrible Kali was not held in esteem.

Lal Chandra's domain lay far from any community, and the servants did not leave the grounds of the mansion. This meant that the man, one of Lal Chandra's slaves—Fedor recognized him in spite of his distorted features—was not the accidental victim of a fanatic. He had been strangled on the grounds, inside the high wall, for some transgression, or simply because Lal Chandra needed a corpse.

A terrifying thought struck Fedor. Lal Chandra was not concealing anything from him, did not hesitate to show him a man whom he had seen alive the day before and who had been strangled in such a fashion.

This could only mean that Lal Chandra considered Fedor as good as dead. When the job was finished Fedor would be strangled just as efficiently as this poor creature had been. For an instant Fedor thought he could feel the noose round his neck. He swallowed convulsively. Without thinking, he took a step towards Lal Chandra.

The Brahman glanced at him in alarm. The silent duel lasted for no more than a second. Then Fedor pulled himself together, turned and asked in a toneless voice what he was to do next.

Lal Chandra calmly approached the corpse and plunged the sharp tip into the brown shoulder.

"Stick your tip into his foot," he ordered.

"I ought to stick it into you," went through

Fedor's mind. "But where would that get me? There are probably thugs in the next room. Never mind, your turn will come."

Fedor silently pushed the tip of the cable into the dead man's foot—and leaped aside with a cry. The man's leg had jerked, bent at the knee and then jerked forward as though it was about to kick Fedor.

Lal Chandra's laughter rang out beneath the vaulted ceiling of the laboratory.

"Scared, Russian warrior?" he asked mockingly. "Don't be afraid. He cannot harm you."

Fedor took a deep breath. He gave the Brahman a challenging look and said: "I am a man of war accustomed to dealing with living adversaries." He added in Russian: "May the dogs sniff at you, you murderer!"

Later, Fedor found an opportunity to tell Jogindar Singh about the horrifying experiment.

"That means he is gathering thugs," said the elderly carpenter. "Well, thugs are mortal. When the time comes we'll see whether the goddess Kali is pleased by the death of her priests."

CHAPTER FIVE

WHICH ACQUAINTS THE READER WITH NEWCOMERS IN LAL CHANDRA'S HOUSE

A long caravan passed through the iron gate leading out of Lal Chandra's garden. In front went eight elephants loaded with the wooden and metal parts of the water-wheel and the big lightning machine. After the elephants came

several two-horse carts carrying the workmen. Fedor, Jogindar Singh and Bharati rode in the first cart. Far behind rolled carts drawn by longhorn oxen, carrying materials that would not be needed at once. The slow oxen would reach the temple only on the third day. The elephants and the horse-drawn carts would arrive there in about twenty hours.

The caravan crossed rivers and small streams that were beginning to dry up. Each time the elephants entered a stream they behaved the way elephants always do, sucking up water with their trunks and then spraying it over their heads and backs.

"What wonderful animals!" Fedor exclaimed. "So clever and so industrious."

"Aren't there elephants in your country?" Bharati asked.

"No," said Fedor, suppressing a sigh. "They're fine animals but I'd willingly never see another elephant again if only I could return home."

Jogindar Singh glanced at Fedor, noting the sad expression on his face. "Is there anyone waiting for you at home?"

"Yes, of course. My mother, my father and my sister."

"No wife or children?"

Fedor gave a wry smile. "When you're in the navy you don't have much time to build a nest of your own."

"Father," said Bharati, "the foreigner is weary from the long journey, yet you plague him with questions."

Fedor stretched out a hand and gently touched the girl's shoulder. With a graceful movement she freed her shoulder from his hand.

The cart shook as it rumbled across the stony, practically dry, bed of one of the numerous tributaries of the Ravi. On the other side they halted, unharnessed the horses, and settled down to rest in the shade of a large tree.

The carpenter built a fire and Bharati began to prepare their evening meal. It was still so light that the flames looked pale.

Fedor picked up a dry stick and started to whittle it.

"If you have courage you can escape from here," the old man said all of a sudden in a low voice.

"Escape?"

Jogindar Singh squeezed Fedor's arm above the elbow.

"Speak softly. There are many alien ears here. Listen carefully. The river on which the Kali temple stands flows into the Indus. If you sail down the Indus for ten days you will reach the sea."

"The sea?" Fedor whispered.

"Just before it enters the sea the Indus divides into many arms," the carpenter went on. "If you follow the northernmost arm you will reach the sea near the village of Karachi. But if you take the southernmost arm and then sail along the coast to the southeast you will come to the Island of Diu. The Portuguese seized it long ago and have built a fortress there. Do you know the Portuguese?"

Fedor rubbed his brow with his hand, straining his memory to recall the Portuguese maps he had seen in France when he was studying navigation there.

"But Diu is somewhere far to the south. About 500 sea miles from Karachi."

"I do not know how to measure that distance," said Singh, "but it is no longer than the voyage down the Indus. Look." He took the stick Fedor had been whittling and sketched, in the sand, a plan of the route along the coastline.

Fedor sprang to his feet and walked around the campfire. The sea! He could hear the hurricane wind roaring in his ears and see the blue expanses shining in the sun. The sea! Only the sea route could bring him home.

Suddenly he remembered where he was. He sat down and picked up the stick again. As he whittled he said, his voice discouraged, "Thank you for your kind advice. But I cannot go to sea in a nutshell."

"Listen further." Singh moved closer to him. "Draw me the plans and I'll build you just the kind of boat you want," he whispered. "There will be a great deal of work going on at the Kali temple, and I'll be able to deceive Lal Chandra's men. They won't notice anything." The old carpenter fell silent. Then he said, "But before you make your escape you must tell us everything you know about the miracles Lal Chandra is preparing."

Soon after, the caravan set out again. Jogindar Singh fell asleep inside the cart. Fedor sat on the box in front, gazing thoughtfully at the road, white in the moonlight, which stretched ahead.

He could see only one thing before his eyes—a sturdily built boat with low sails. It must have a sliding keel, like those on Turkmen feluccas. Then no squall could overturn the boat. Oh Lord, could freedom really be so near?

Suddenly he heard soft weeping. He turned round to look into the dark depths of the cart, which was covered with linen cloth. It was Bharati! Fedor felt ashamed of himself. There he was, rejoicing like a child and forgetting all about her!

He stroked her hair and patted her shoulder in the darkness.

"Darling," he whispered. "Did you think I would go anywhere without you? Don't be afraid. Your seas are warm, and I'm a good sailor. I'll take care of you. We'll make our way to Russia. Then everything will be fine."

The girl gave a sob and raised her tear-stained face.

"How can I leave Father?" she whispered.

"Why, we'll take him along too! When the time comes we'll tell him everything. He'll understand."

Bharati shook her head sorrowfully. "No, he won't go anywhere. He won't leave his people. And I can't leave him."

Fedor fell silent, overwhelmed by despair.

The caravan reached the temple at dawn. Fedor sprang down to the ground at once. He felt light-headed from lack of sleep and his thoughts were confused and disconnected.

From dawn to dusk sweat poured from the slaves of Lal Chandra and from the Sikh artisans as they laboured beneath the merciless sun. They drove piles for a dam into the bed of the dried-up stream just above the waterfall, and hacked through the rocky bank so that the water behind the dam could reach the chute. In the

hollow leading to the temple they set up thick logs to support the chute. They made a frame for the water-wheel.

Fedor was so busy from morning to night that he hardly ever saw Bharati. He had no chance to talk with her father except about the dam or the chute, for Lal Chandra's overseers were always close by.

"Will Jogindar Singh be able to handle the job without you if we return to the house for a few days?" Lal Chandra asked Fedor one evening.

"Yes, of course."

"I want you to talk to him tomorrow morning and tell him what to do. Give him and his men an assignment for each day. I want you to be prepared to leave tomorrow evening, as soon as the heat abates."

The next morning Fedor handed Jogindar Singh several drawings and took him aside to explain what they were about. They seated themselves on planks laid across the posts which would support the chute. There was no one nearby.

As they examined the drawings Fedor discarded one of them. The carpenter took the crumpled sheet from him and smoothed it out on his knee. It was a drawing Fedor had made during a sleepless, lonely night, a sketch of a sailboat with a sliding keel.

"This sketch is all to no purpose," Fedor muttered gloomily. "I don't need a boat at all because I love your daughter and she cannot leave you at such a time."

Jogindar Singh closed his eyes.

"We'll do everything we can to save you before the festival," he said finally, after a long silence. "But anything could happen—"

Many changes had taken place in Lal Chandra's mansion. Here, there and everywhere Fedor saw strangers who spoke dialects he could not understand. These were itinerant fakirs. They showed one another the miracles they were preparing to perform at the festival in honour of the renovated temple. They completely ignored Fedor and he was able to see what was behind their miracles.

One morning three men with heavy sacks appeared at the gate and asked to see Lal Chandra. They were ragged and emaciated, with long hair and matted beards, their dark-skinned bodies were covered with scratches and bruises.

Ram Das learned afterwards that they were just back from the Himalayas. Lal Chandra sent them there at a time when the stars were propitious to lay large cakes of rare, precious resins on top of the highest snowy peaks in order to bring the resins closer to the stars. They had spent some time there in the mountains—suffering from the intense cold, living on scanty rations, and trembling in fear of the mountain spirits. Of the seven whom Lal Chandra had sent, four perished in the fissures of glaciers or fell over precipices. This was all that Ram Das was able to learn. He predicted that no one would ever again see the three men who had returned with the resins.

Soon after, a tall, portly Brahman in white robes appeared in the mansion. Lal Chandra treated him with great deference. On the morning of the Brahman's arrival Lal Chandra sent Fedor away for the whole day.

Fedor had a great many things to keep him busy. On Lal Chandra's orders he stretched

the plaited copper cables covered with resin-impregnated silk from the lightning machine into the garden, to the pool at whose edge he and Bharati used to sit in the evenings.

Posts which had been soaked in oil were set up on both sides of the pool. Copper bars attached to the posts were lowered into the water. At the ends of the bars there were highly polished concave copper mirrors that faced one another in the water.

An enormous, tower-like barrel, fourteen feet in diameter and a good thirty-five feet high, made of sheets of copper, stood beside the pool. Fedor had drawn the plans of the barrel only a short while before, at the Kali temple, and he was amazed to see it completed when he returned to Lal Chandra's house. For two days in a row men had scooped water out of the pool, had climbed up to a platform on top of the copper barrel, and had poured more than 10 000 pails of water into it. Then Lal Chandra himself had climbed to the top of the barrel and sprinkled several bags of spices and gums into the water.

A thick copper chain hung from the platform into the water. Similar copper cables covered with silk connected the barrel and the chain with clips at the pool.

Fedor knew that the force produced by the lightning machine could pass anywhere along metal, but not through silk and wood soaked in oil.

He also knew that this force was strongly drawn to the ground, from which all metal parts had to be kept away.

Lal Chandra and Fedor carefully examined all the connections.

"Strike the gong to set the machine in motion," Lal Chandra said in his gentle voice.

The imposing Brahman strolled towards the pool. Lal Chandra deferentially explained something to him in a language Fedor did not understand. They both kept their eyes on the surface of the pool.

Near one of the bars the water bubbled and boiled as though it were being heated by invisible fires. At the other bar the water was far less turbulent but a faint, strange-smelling mist was rising from it.

Lal Chandra picked up the free end of a wire and, holding it at arm's length, brought it up to the bar where the water was bubbling.

There was a crackle, a flash of lightning, and a great pillar of fire shot out of the water.

Fedor leaped aside; he stared flabbergasted at the bright pillar of flame. The flame shrank in size but it remained as bright as ever. If anyone had told Fedor that water could burn he would not have believed it. Yet now—

"Break the path of the mysterious force," Lal Chandra commanded.

One of the cables ran through a wooden frame to which a copper bar was attached at one end by a hinge, while the other rested on a copper plate.

Fedor tugged at a silk cord, and the bar rose. Lightning streaked between the bar and the plate for an instant.

The water near the bar immediately stopped bubbling and the flame died down.

"Now open the path to the force," Lal Chandra said.

Fedor released the cord. The copper bar dropped to the plate. Again the water bubbled and seethed, but there was no flame.

Lal Chandra picked up a clay pitcher of fragrant oil and, tipping it cautiously, poured some oil into the water above the mirror attached to the bar.

The oil instantly flowed through the water to the other side of the pool. They could see the oil forming a ball as it stopped above the opposite mirror.

With Fedor's help Lal Chandra lifted a huge pitcher containing at least three pails of the same fragrant reddish oil and poured it into the pool.

Instead of spreading across the surface the oil sank into the water and flowed in a long stream to the opposite mirror. A fairly large-sized ball of oil had now formed there.

Lal Chandra picked up a ladle with a long handle and dipped out the oil. The mysterious force did not strike him.

Fedor was so impressed by everything he had seen that he could not get it out of his mind. That night he lay awake a long time. "I must get to the bottom of it, no matter what," he resolved.

CHAPTER SIX

IN WHICH FEDOR MATVEYEV TRIES TO KILL THE BRAHMAN

Fedor lay in bed with open eyes, unable to fall asleep. Scenes from the past went through his mind. How fed up he was with this foreign land! How he wished he were home!

More than five years had passed since Prince Bekovich-Cherkassky's detachment met its doom. He had been in the service of Lal Chandra for nearly five long years.

"I'll probably be granted a good long furlough if I ask for it as a reward for what I've gone through," he reflected. "Then I can have a holiday at home. Mother and Father probably think I am dead. Father Pafnuty must have conducted a funeral service."

Sleep was out of the question. Fedor rose from his bed. In a loin-cloth and a thin shirt he stepped across the windowsill to a covered gallery that ran round the inner courtyard. There it was somewhat cooler than in his room. Fedor leaned against the railing and again gave himself up to thought.

Suddenly he heard voices. He pricked up his ears and listened. They were speaking a language he did not know, the language in which Lal Chandra talked to the fakirs. He recognized Lal Chandra's gentle voice. Sometimes it was interrupted by an imperious, sharp, threatening voice. Fedor realized it was the voice of the Brahman who had been present during the experiment with water, fire and oil. He must be an important person.

The third voice was unfamiliar. It spoke more rarely than the other two and repeated the same phrase, in the same tone, in reply to everything the Brahman said.

The voices were coming from a window on the upper storey of an intricate tower that rose above the central hall in which the altar to Kali stood.

The tower was a square, ledged pyramid covered with sculptured figures of elephants, horses

and many-armed gods. Fedor had always thought the tower was purely ornamental since there was no way of entering it from the house. But now, in the middle of the night, a faint light glowed in the window and it was from there that the voices came.

Something urged Fedor to act. He slipped back over the windowsill into his room, took his knife from its hiding place in the bedding, and tucked it inside his loin-cloth. Then he returned to the gallery, scrambled up a post to its flat roof, and from there made his way to the roof of the house.

As he approached the tower Fedor realized that the window with the light in it was all of forty feet from the roof. Well, in for a penny, in for a pound! Clinging to the high-reliefs of gods and sacred animals, Fedor clambered upwards from ledge to ledge. It was a moonless night, and he thought it unlikely anyone would notice his white-shirted figure against the white masonry of the tower.

Clasping the stone body of a deity, Fedor cautiously peered through the window.

An oil lamp illuminated a round room. The floor was covered with rugs on which bright cushions were scattered.

An imposing-looking old man was seated on cushions in front of a low table covered with papers and rolls of parchment. His thin, deeply wrinkled face, framed in long grey hair, was impassive.

In front of the old man, their backs to Fedor, stood Lal Chandra and the distinguished Brahman. Lal Chandra was now shouting in a high-pitched, venomous voice. The elderly Brah-

man's voice was also savage. But the old man kept calmly repeating the same words.

Fedor glanced about the room with curiosity. The shelves along the walls and the tables were covered with glassware and instruments, and a small lightning machine stood in the corner.

So this was where Lal Chandra got his ideas, thought Fedor. He did not invent his "miracles" himself but took the ideas for them from this old man whom he kept locked up and whom he forced to create all those mysteries for his own purposes.

Now the two Brahmans were evidently trying to force the old man to tell them something.

Suddenly the old man rose to his feet. Tall and thin, he looked at the two Brahmans scornfully from beneath thick grey eyebrows. He began to speak, slowly and calmly. Judging by their expressions, Lal Chandra and his distinguished companion found his words unpleasant.

As the old man moved, Fedor saw something glitter behind his back. Looking more closely, he saw a thin chain leading from the man's belt to a ring attached to the wall.

A feeling of pity mingled with anger swept over Fedor. How he wanted to spring into the room and throw himself on those two torturers. His hand involuntarily sought his knife.

"I'll strike that aristocratic viper first," he thought. "Then I'll settle with Lal Chandra, may the dogs sniff at his corpse. But what next? With all those menials everywhere I won't be able to get out of the house. There are probably guards inside the tower too."

The aristocratic Brahman said something to Lal Chandra in a low voice. Lal Chandra bowed

and went out through a small door under the vaulted ceiling. A second later a tall fakir with a caste mark on his forehead entered. Placing the palms of his hands together, he bowed to the Brahman. Then he went up behind the old man and, taking a thin cord out of his robe, wound it round the neck of his victim, carefully passing it under the old man's grey beard. He twisted the ends of the cord round his hands, raised his right leg, and thrust his knee into the old man's back.

Fedor saw red. Without thinking, he sprang onto the windowsill. Another leap, and he was in the room. He landed a powerful uppercut to the bearded chin of the executioner.

The blow flung the fakir against the wall, where he crumpled into a motionless heap.

Fedor turned to the Brahman and, snatching out his knife, stabbed him in the chest.

Both the knife and Fedor's hand passed through the Brahman's chest as if it were thin air. Fedor fell forward, and his body also passed freely through the body of the Brahman. All he felt was a faint warm wave of air. The Brahman was incorporeal!

"Ah-h-h!" Fedor screamed in horror. "Begone, demon!"

The Brahman dashed to the thick, iron-bound wooden door. Without opening the door he passed straight through it and vanished.

"Rise, young man. Time is precious," said the old man in Hindi. "Do you understand me?"

Fedor, who was still sitting on the floor, looked about wildly. He was shaking. He brought his trembling hand to his forehead and quickly crossed himself.

"Rise," the old man repeated imperiously. "Rise and bar the door."

Fedor obeyed, muttering "Begone, demon! Begone, demon!" under his breath.

"Now hand me that vessel."

Like a sleepwalker, Fedor moved over to a shelf, took down a vessel of red glass, and handed it to the old man.

The old man folded the middle section of the chain in two and dipped it into the vessel, from which acrid smoke arose.

"By killing the high priest you will confer a great blessing on the people. But you cannot do it with an ordinary knife. If we are not interrupted you will understand. I shall make your knife suitable for that purpose."

The old man lifted the chain out of the vessel and examined the links, which had grown quite thin. He tore the chain apart. Then, dragging the end of the chain behind him, he hurried over to the lightning machine. He picked up the ends of wires leading from the machine and connected them to several copper vessels. Next he quickly re-arranged some silver rings round which wires had been wound.

"Quick, your knife!"

Fedor stood staring at the machine with unseeing eyes. The old man seized him by the collar of his shirt and shook him energetically.

"Wake up! Wake up! Do you understand me?"

Fedor nodded weakly.

"Give me the knife! Now turn the handle!"

Fedor turned the handle, producing a shower of blue sparks. The old man thrust the blade of the knife into one of the rings. A faint aureole shone round the knife.

"Turn faster!"

The aureole grew brighter, then suddenly died out.

"That's enough! Now grasp the knife by the blade."

Fedor saw his fingers pass through the blade as though it were made of air. With a cry, he drew back his hand and stumbled towards the window.

"I was told you were a warrior but I see you are a cowardly old woman!" the old man cried furiously. This brought Fedor to his senses.

Hesitatingly, he picked up the knife by the handle. It was an ordinary handle, solid all the way through. He touched the tip of the blade with the palm of his hand. His palm passed through it and reached the handle.

"The blade can now injure no one except the high priest," said the old man. "But for him it means death."

Voices came from below. Looking out, Fedor saw that the yard was filled with men carrying torches.

"Now listen to me," said the old man. "As long as I preserve my secret my life is safe. No matter how hostile they are they will not harm me, for my death would be more terrible to the high priest than his own death. This is not the first time they have tried to frighten me by pretending to strangle me. You have nothing to fear either until they carry out their plans. They need you to build things for them."

Footsteps and voices were heard outside the door.

"Remember that only this knife can strike down the high priest," the old man whispered rapidly. "Now it is still too early. But you will

slay him when the time is ripe. Hide the knife outside the window. I'll find a way of getting it to you. Do you understand me?"

"Yes."

Fedor thrust his head and shoulders out of the window and slipped the knife into a hollow in the stone carving. The old man also thrust out his head, felt for the knife with his hand, and gave a satisfied nod. Then he returned to his place and seated himself on his cushion, concealing the broken chain.

All of a sudden the high priest entered the room through the barred door. He gave Fedor an icy glance.

"When you raised your hand against me, foreigner, you did not know what you were doing", he said. "Therefore, I forgive you. Only by complete obedience can you atone. Now, unbolt the door!"

Fedor stared at him in terror. Fighting down his fear, he went to the door and pushed aside the bolt.

Lal Chandra entered, followed by servants carrying torches. At a sign from their master two of them lifted the motionless body of the fakir and carried him out.

"You do not know our customs, young man," Lal Chandra said in an even voice. "It was your *Karma* that brought you here. I advise you not to meddle in our concerns, which are beyond your comprehension."

Thus ended a night that had been a nightmare. But it had an unexpectedly happy ending for Fedor.

The next day Lal Chandra took Fedor back to the temple of Kali.

CHAPTER SEVEN

IN WHICH LAL CHANDRA SAYS TO FEDOR THAT HE IS NOT NEEDED ANY MORE

The summer heat began to abate. Monsoonal winds from the ocean piled up dark rain clouds. The first rains fell in the mountains.

Lal Chandra went about with a worried expression on his face. He drove the builders to exert themselves to the maximum. Time was running out. The stream would start to rise any day now.

The dam, flood-gate and chute were ready. So was the water-wheel. Long wooden shafts now ran from it through an opening in the temple wall into a room just off the main hall. Attached to each shaft were ten wooden discs, each fourteen feet in diameter, covered with a smooth, shiny coat of a rare resin.

On either side of the discs were gold-leaf plates across which swept brushes of fine gold thread.

Not far from the machine stood twelve enormous copper vats. All this was connected by an intricate system of copper cables wrapped in oil-saturated cloth. Copper bars with ebony handles had been inserted into the cables at intervals. They were used to help switch the mysterious force to wherever it was wanted.

In the main hall of the temple there was a sunken pool in front of the statue of Kali. The copper cables connected with the concave mirrors were hidden in the water of the pool.

Day by day the stream rose. Barred by the dam, it filled the rocky gorge and raced over the open spillway with a roar.

After that memorable night two sturdy fakirs openly followed Fedor wherever he went. At night they slept outside the door of his room in the temple. It was utterly hopeless to try to tell Jogindar Singh about the incorporeal Brahman, for the fakirs brazenly squatted beside them and listened to everything they said.

Could the incorporeal man have been just a nightmare? Again and again Fedor recalled how the knife in his hand had gone through that wraith. Fedor was not a coward. He had gone into battle time and again without flinching. But he felt helpless when it came to mysterious forces.

Fedor also recalled the old man in the tower and the knife he had turned into air before Fedor's eyes. Fedor tried to remember how it had happened. While he was turning the lightning machine the old man had thrust the knife into some twisted wires. The lightning machine was somewhat different from Lal Chandra's. Fedor vaguely recalled that the old man had said the high priest could not get along without him. Did that mean the old man was the one who had made the high priest incorporeal?

He also recalled the terrified face of the incorporeal high priest when he, Fedor, had rushed at him with the knife. Why should he have been terrified? Perhaps he had not been incorporeal long and was not yet used to it.

Fedor's head was in a whirl. He simply had to tell the Sikhs about the miracle. Ram Das was the one to tell it to. But Lal Chandra had sent Ram Das off on an errand.

He never should have listened to the old man. Instead of hiding the magic knife he should

have plunged it into that incorporeal high priest and been done with it.

Fedor was sitting alone in his room late one evening when he suddenly heard a deep roar outside. He dashed out of the room. His guards, sleeping beside the door, sprang to their feet and ran after him.

The roar was coming from the chute. Fedor realized that the water gate had been raised and water was now rushing towards the wheel. He ran into the main room of the temple. In the darkness he easily found the narrow door behind the six-armed goddess and stepped into the secret room where the lightning machine stood. He saw what he had expected to see. The discs were whirling at a tremendous rate, making a soft, swishing sound. The gold plates had merged into circles; they reflected the reddish light of the oil lamps. The air in the room was filled with the freshness that accompanies a thunderstorm.

Six men, none of whom Fedor had ever seen before, were tinkering with the machine. Lal Chandra stood to one side watching. He had not heard Fedor enter.

A sense of deep injury engulfed Fedor. He had put so much hard work into building the machine! He had invented so many things connected with it! Yet they had not even called him to watch the trial run.

Forgetting everything except his resentment, Fedor tugged at Lal Chandra's wide sleeve.

Lal Chandra started in fright.

"What are you doing here?" he asked, turning round to face Fedor.

"Why didn't you tell me?" Fedor shouted.

"You are not needed any more." Lal Chandra's voice was no longer gentle.

Fedor seized the Brahman by the collar and shook him.

"I'm not your slave! I'm a lieutenant in the Russian Navy!" he shouted angrily. He spoke in Russian, as he always did when excited. "I'll shake the wits out of you."

Lal Chandra screamed hoarsely. The men turned round, dropped what they were doing, and flung themselves on Fedor. Fedor fought back furiously. The Indians were unfamiliar with fist fighting, and he knocked them down one after another. But they immediately rose to their feet and attacked him again.

Lal Chandra bent down and scuttled through the low door. Fedor tore himself away from the clinging hands of his attackers and dashed after him. Lal Chandra ran back and forth, hampered by his long robe. For a moment the two men raced round the grim goddess like children, changing their direction all the time.

Men carrying torches appeared, and half a dozen of them fell on Fedor. But he tore loose once more and, making a leap, caught Lal Chandra by the sleeve. With the deepest satisfaction he drew back his arm and smashed his fist into Lal Chandra's cheekbone. The Brahman fell backwards into the pool.

The last thing Fedor remembered was the sensation of being strangled. When he recovered consciousness he was lying in his room. His head rang and his arms ached. He went to the door and gave a pull. It was locked from the outside.

Fedor saw no hope of ever being set free.

Twice a day he was brought a bowl of meagre fare. Lal Chandra's men kept a close watch over him.

One evening he was sitting on the floor of his vaulted room, beside a low table, going over his notes by the light of an oil lamp. He had started a diary long ago, while on the way to India. But what was the use of these notes now? His eyes wandered sadly around the dusk-filled room. He would never be able to escape from here.

He closed his eyes and let his head drop into his hands.

A pebble suddenly fell on the floor. Fedor gave a start and jumped to his feet. A faint rustling came from somewhere above his head. Lifting his eyes, he saw a swarthy bare arm thrust through the ventilation opening.

"It's starting," he thought in alarm. "They'll let snakes down through holes or sprinkle poison on me."

"Fedor," a voice softly called.

Fedor's heart lightened as he recognized the voice of Ram Das. How had he made his way through such a narrow passage? He must have removed some bricks.

"Let me hear your voice," said Ram Das from behind the wall.

"It's me, all right. Who else could it be? Listen to what I have to say, Ram Das." Fedor quickly told him what had taken place in the tower.

"Did you say the Brahman is incorporeal?" Ram Das interrupted him. "Did you say he can pass through solid walls?"

"Yes."

"You saw it with your own eyes?"

"Yes."

"Are their gods really so powerful?" There was a note of fear in Ram Das's voice.

"All is lost," thought Fedor in despair. "The Sikhs were my only hope. When they see this miracle at the festival they'll give up all resistance."

"Listen, Ram Das, but that's not all." Fedor hurriedly related how the old man had given the blade of his knife the property of penetrability.

"Can the incorporeal Brahman really be slain with that knife?" came Ram Das's hollow-sounding voice.

"Yes, yes, he can! The knife is hidden in a crack in the wall outside the old man's window. Be sure to get it, Ram Das."

"The old man is kept under such heavy guard that it's hard to break through to him. But I'll do whatever I can to help you. You must be prepared. Goodbye. I must go now."

CHAPTER EIGHT

WHICH TELLS OF THE END OF THE INCORPOREAL BRAHMAN

The roads were thronged. From Gujarat and Rajputana in the south, from the foothills of the mountain ranges in the north, and from Lahore and Delhi in the east crowds of people converged on the river Sutlej, a tributary of the Indus, where the miracle had taken place.

In the land where lived the apostate Sikhs, who had rejected the gods of the Brahmans,

these gods had decided to remind men of their existence. The goddess of love and death, the awe-inspiring Kali, was displaying mysterious powers in a long-abandoned temple.

That was what friendly men told the pilgrims at crossroads and villages on the way. These men distributed food and pointed out the route. Closing their eyes as though in prayer, they related that a certain pundit had attained the highest knowledge. Although he had repudiated his body he was still visible, and hence he was called the Mahatma Ananga, the "great soul without flesh".

Tales were told at roadside campfires of how Mahatma Ananga, gathering his faithful pupils about him, had begged the gods, through Kali, who had close ties with humans, to bring accord to an earth torn by dissent.

In response, the gods had given a sign. When the body of a pupil of the Mahatma Ananga, who had died in the cause of the highest knowledge, was brought to the temple of Kali, the goddess had refused to accept his death.

The body of the righteous man had been lying in trepidation at the feet of the ruler over life and death for many days. Kali refused to accept his death.

Since the goddess kept a strict account of those who were born, coming from their past incarnation, and those who died, passing into the next incarnation, the return to life of the righteous man would have to be paid for by the sacrifice of another life.

The day of the sacrifice had been appointed. On that day awe-inspiring Kali would show one and all the power of the ancient gods.

The pilgrims arrived in large groups, keeping close together. To lag behind was dangerous. The elusive brotherhood of Thug assassins had already strangled several people to death in honour of their goddess.

There were crowds of people all around the temple. The hollow between the temple and the bank of the stream was closely packed with tents and primitive shelters.

Bright sunlight illuminated a colourful scene: white-robed men, women in flowered veils, bronze faces and bodies, countless carts. Temple attendants distributed an infusion of thorn apple leaves among the pilgrims, to "free them from their sins." This was a narcotic that temporarily deprived people of their reason and memory. They also distributed a beverage made of poppy-seed called "the tears of oblivion". They were particularly generous with bhang, a beverage made from the juice of the tender tops of Indian hemp mixed with an infusion of nutmeg and cloves.

Clouds of flies hovered above the camp of the pilgrims. The odour of fragrant spikenard mingled with the smells of food, human and animal sweat, aromatic incense, the smoke of campfires, and the wormwood-like odour of narcotics.

The pilgrims grew more and more excited. They demanded miracles.

The Sikhs, bearded and in turbans, did not take part in the religious frenzy. They camped to one side and seemed to be waiting for something. People scowled at them because the Sikhs were apostates. Knowing, however, that the

Sikhs did not recognize the philosophy of Ahimsa, or non-injury of animal life, they took care to give them a wide berth.

In the evening innumerable campfires burned bright as people made their evening ablutions and cooked food. Temple attendants distributed rice and a powerful mixture of opium and bhang. The excitement that now swept through the crowd was even stronger than in the daytime.

To the beat of drums inside the temple a Brahman emerged to announce that the temple was now open. A howling crowd surged in through the doors, filling the vast hall and all the passages. The Sikhs were the last to enter. They took up places along the walls, none of them mingling with the crowd.

Semi-darkness reigned inside the temple. The oil lamps cast quivering shadows on the sinister faces of the goddess, on the garland of human skulls round her bronze neck, and on her belt, an interlacing of chopped-off hands. The rubies in her eye-sockets glowed.

A human body lay motionless at the feet of the goddess, its outlines vague beneath the white shroud.

Suddenly the drums fell silent. An imposing Brahman appeared on the small open space between the pool and the goddess. He waited until the crowd was quiet, then said in a resounding voice:

"Brothers, do not be surprised at what your eyes will see. Keep calm, for each has his own *Karma* and the gods are all-powerful. Let us praise the great Kali. May the gods show us miracles to strengthen our faith!"

There was a faint crackle in the dead silence.

Suddenly, flames leaped up out of the bowls on the tripods around the pedestal of the goddess. A murmur of astonishment ran through the crowd.

The Brahman pressed his hands together in prayer and turned to the statue.

"Oh mighty one, oh black-faced one! She who tramples on the decapitated!" he intoned. "Manifest your will, for through you the Creator, the Preserver and the Destroyer rule us! Give us life or give us a merciful reincarnation!"

His last words were drowned by peals of thunder. Dazzling streaks of lightning flashed through the clouds of smoke, in the direction of the crowd, from the pointed fingers of the terrible goddess, from the tips of her pointed nipples, and from the ends of her long eyelashes.

The crowd was gripped by terror. Shouting and pushing, people hurried towards the exit. But their way was barred by crackling blue flashes of lightning that came from the bronze lances decorating the archway.

"Oh you of little faith!" intoned the Brahman. "Why are you frightened? Did I not announce that the will of the gods would be manifested to you?"

The lightning stopped, and the crowd ceased to mill about. Silence fell as the people timidly pressed closer to one another. Suddenly cries came from the hall:

"Look, a dead man!"

"This man is dead too!"

"Death has entered the temple!"

Here and there in the crowded hall lay the bodies of those who had been struck by lightning.

"Frightened, you of little faith?" the Brahman shouted. "How can flight save you from the

will of the gods? Does not death at the hands of Kali give the chosen a better incarnation? Pray! Beg the goddess to open your eyes!"

Where space permitted in the tightly-packed crowd, people prostrated themselves, their hands pressed together devoutly.

"Now gaze on this!" the Brahman commanded. "The Mahatma Ananga himself, the man without flesh, will appear before you!"

The Brahman stepped to one side, his hands pressed together in front of his face.

A sigh of wonderment swept through the temple as a man in a long white robe came into sight straight out of the pedestal. He silently spread his arms, blessing the pilgrims, and strode into the crowd. People separated to let him pass, but he did not need an opening. He walked straight through the crowd, straight through people. They realized that he was incorporeal. Some tried to grasp the hem of his robe to kiss it but their fingers passed through the fabric as though it were woven of air.

There were cries of awe-stricken horror beneath the vaulted ceiling of the temple. Men fell to their knees to kiss the floor where the Incorporeal Brahman had walked.

After passing through the amazed crowd Mahatma Ananga returned to the Kali pedestal. With an imperious gesture he commanded silence. Then he began to speak.

"The gods have liberated me from the flesh that oppresses man. I am incorporeal. No human weapon can harm me. I need neither food nor drink. Yet I am alive. My soul has not been reincarnated. This is the gift of the gods to those who obey them implicitly. But what do you

live for, you who are wrapped up in concern for your pitiful bodies? A handful of rice is more precious to you than Nirvana."

He talked for a long time, wrathfully condemning those who preferred the miserable blessings of the present life to future reincarnation. Untouchables must stop the practice of adopting Mohammedanism or Christianity. The gods would not forgive those who failed to keep the faith. The apostate Sikhs had not resigned themselves to their fate. They wanted to gain possession of lands that belonged, by the will of the gods, to the Brahmans. They must repent and return to the ancient faith before it was too late. Otherwise the gods would punish them so sternly that no trace of them would remain. The patience of the gods was exhausted. They were incensed. Through him, Mahatma Ananga, they had resolved to manifest their will and punish the recalcitrants and apostates.

While all this was going on Fedor Matveyev languished in the machine room next door, his arms chained to rings in the wall.

The enormous discs revolved and hummed rhythmically. Lal Chandra stood with his eye at a tiny hole in the wall, watching what was going on in the hall. From time to time, without turning round, he said something, and his assistants did his bidding, moving the copper bars back and forth to open and shut the path of the mysterious force.

From the way they moved the bars Fedor could imagine what was taking place in the temple. He could hear the roar of the crowd and

the awe-struck cries as the miracles were performed.

He himself had built these machines whose lightning would soon reduce him to ashes. His friends, the Sikhs, were somewhere near, but what could they do? They were lost in the frenzied crowd. Besides, they too might succumb to the Brahmans at sight of the miracles.

Two fakirs approached Fedor, untied his bonds and, gripping him by the arms, thrust him through the low door into the hall. He found himself facing the Incorporeal Brahman. On the other side of the pool was a sea of heads, malicious grimaces and hateful eyes.

"This wretched foreigner wished to deprive me of life," the Incorporeal Brahman said disdainfully. "He did not know that only the gods can do that. Give him a knife. Let him try once again to pierce my body."

An expectant murmur ran through the crowd. A grinning fakir stretched out a knife to Fedor, who struck it from the man's hand. The knife clattered as it fell on the stone paving.

"If only I had the knife the old man hid." Fedor thought. "But evidently that is not to be. Say your last prayers, naval lieutenant."

"Remove the shroud," said the Brahman.

When the shroud was lifted, a naked corpse was revealed lying at the bronze feet of the goddess.

Lightning streaked from the fingers of Kali.

A scream of horror rang through the hall and was then echoed and re-echoed time and again. The corpse had come to life. It quivered and stirred at the feet of the terrible goddess.

"Look here, one and all!" the Incorporeal

Brahman shouted. "The goddess refuses to accept the death of my finest pupil. He hovers between life and death. The time has not yet come for his reincarnation! But if Kali is to return him to life she must receive a sacrifice in exchange!"

Twelve attendants marched up to the pool in single file. Each carried a pitcher on his shoulder, the thick, dark, odorous contents of which he poured into the pool.

"We have brought you precious oil as a sacrifice," the Incorporeal Brahman intoned, turning to the goddess. "Will you accept this bloodless sacrifice?"

There was a sound of gurgling. The water in the pool began to boil. The oil gathered into a dark ball, then streaked through the water to the opposite side of the pool, throwing up a fountain. For an instant the pillar of oil stood motionless, then it collapsed, sprinkling the crowd with fragrant drops.

"The goddess rejects a bloodless sacrifice!" cried the Mahatma Ananga. "She gives it to you with her blessing. She demands a human sacrifice. Those pilgrims who were chosen by the sacred lightning have been given a happy reincarnation. Their death was a joy to them. But this foreigner will meet a terrible death, for he is alien to our gods and will be given the lowest reincarnation. His soul will pass into the body of a blind worm that gnaws away at seaside cliffs!"

The water in the pool began to seethe. A bright flame appeared on top of it.

"See, the goddess agrees!" shouted the Incorporeal Brahman. "The water has turned to fire! May the foreigner die without bloodshed.

Kali herself will give him death. Place him at the feet of the goddess, beside my pupil. Let everyone see the goddess take the life of one man and transfer it to another man!"

Fedor desperately ran his eyes across the crowd. The faces were hostile. "This is the end, Fedor Matveyev," he said to himself. "Here come the fakirs. Now they'll seize you—"

"Watch out, Fedor!"

Suddenly he was gripped by a feeling of grim merriment. He stared eagerly at the back of the hall, where the light was dim.

Something flew over the heads of the crowd and fell at Fedor's feet. In a flash he bent down, snatched up his knife by the handle, and plunged it into the breast of the Incorporeal Brahman. He felt the cloth of the robe resist as it tore.

A spreading patch of blood stained the white robe of the Mahatma Ananga. He wheezed, choked and would have fallen if Fedor had drawn his knife from the wound. But Fedor did not release the handle. He realized in a flash that if the Incorporeal Brahman fell he would sink through the ground, creating a miracle that would spoil everything.

His ears failed to register the shouts of the crowd, and he did not know what was going on behind his back. All he felt was that the Mahatma Ananga was growing heavier and was slipping sideways.

Death had returned the usual properties to the body of the Incorporeal Brahman. Although Fedor firmly clasped the handle the knife pulled *itself out of the body. No longer supported by* the knife, the body dropped to the stone floor with a dull thud.

An instant of eerie silence was followed by cries of rage and fear.

Ram Das ran up to Fedor and seized him by the arm.

"This way!" he cried. "Hurry!"

CHAPTER NINE

IN WHICH A STAR ABOVE THE WATER TURNS OUT TO BE A SHIP'S LIGHT

Fedor let the helm slip out of his hands. It did not matter since he could see nothing whatsoever in the utter darkness. Besides, it was raining violently.

The powerful current swept the small boat downstream. The heavens split open with a sound like the ripping of a sail. Streaks of lightning lit up a wide, swollen river, uprooted trees and a thick wall of rain.

"We're being carried by the current," he thought. "Let's hope we hold out until dawn."

He sat in the stern, trying to shield Bharati from the rain with his body. The girl's head was in his lap. She was trembling. Fedor stroked her wet hair. He could find no words with which to comfort her.

Jogindar Singh's body lay on the deck, his white robe a blur in the black night. His strong arms lay by his side. Never again would those arms wield an axe.

The Sikhs had failed to find Lal Chandra. The sly Brahman had escaped through secret passages. Almost immediately after, armed men began to encircle the temple. The Brahmans and rajahs

had evidently stationed them nearby in case something went wrong. Shots rang out in the courtyard of the temple and in the dark passageways. The Sikhs brandished their curved daggers.

Ram Das had led Fedor unnoticed out of the temple and down to the stream, where Bharati and her father were waiting. They set out in the direction of the Sutlej in the rain, stumbling over the rocks in their path. Shots sounded behind them. Suddenly Jogindar Singh pitched forward to the ground with an anguished cry. Fedor picked him up and carried him on his back. He and Bharati pushed through thickets for a long time before they finally reached the Sutlej. There Bharati found the sailboat, tied to a boulder.

Dawn came at last, the grey light revealing a rain-spattered river the colour of yellowish mud. Bharati, petrified by sorrow, sat beside the body of her father.

It took every ounce of Fedor's strength to guide the boat towards a small island. Near the shore he leaped into the water and then dragged the boat up onto the wet sand.

In the tiny cabin under the deck he found an axe. The carpenter had seen to it that the boat was fully equipped. Fedor hacked out a shallow grave in the rain-soaked earth and tenderly laid the body of Jogindar Singh in it. After covering the grave with earth he built a mound of stones on top of it.

Bharati's rigid face frightened him. It would be easier for her, he thought, if she would give way to tears. He touched her shoulder. Silently,

she turned away from the grave, and silently she climbed back into the boat.

Waist-deep in the water, Fedor tugged at the boat to free it from the sand. His feet sank in the silt. Finally he gave a push that took his last strength. Dislodged, the boat slid forward into the river.

Suddenly he heard Bharati scream in terror. Turning his head, Fedor saw that her face was drained of colour. She was pointing at something with a hand that trembled, keeping up a piercing cry. Fedor swung round to see a long brown log heading rapidly towards him. Suddenly the log opened a monstrous mouth lined with sharp teeth.

Fedor pushed off from the bottom as hard as he could and scrambled up onto the deck of the boat. That very instant he heard teeth snap behind his back. Before he could catch his breath Bharati flung her arms round his neck, buried her head on his chest, and burst into tears. She sobbed convulsively, her thin shoulders quivering under his hands.

"You must be careful," she whispered through her tears. "I have no one else but you now. Promise you will take care."

Fedor guided the boat back into the mainstream. He had never seen a crocodile before, although he had heard much about them. He recalled a sentence from one of the first books he had read in childhood. "The crocodile is an aquatic reptile which weeps as it kills and eats its victim." Fedor gave a wry smile as he remembered the crocodile's terrifying jaws. He did not think it likely that such a monster would mourn its victims.

After two days of rain the sun reappeared. Meanwhile, they had reached the Indus, and the mighty river was steadily carrying them towards the sea.

Fedor now tied up the boat on the bank for the night. He built a campfire over which Bharati prepared their simple meal.

At the end of a week Fedor noticed that the river was growing wider; the water was turning clearer by the hour. Finally there came a morning when the boat ceased to move at all. The incoming tide was preventing the river from reaching the sea.

That meant the ocean was near. The light northerly breeze carried with it a tang of salt air.

Fedor raised the foresail, woven of strong palm leaves. Then he lowered the heavy copper-bound sliding keel into the water and hauled in the sheets. The sound of water gurgling underneath the boat filled his heart with joy.

The water grew lighter and bluer until it was the colour of the sky. The banks receded farther and farther, fading into a haze. Finally, a long blue sea wave picked the boat up, rocked it gently, and then smoothly passed it on to the next wave. They had reached the sea!

Fedor gave a deep sigh of relief and smiled at Bharati. The girl smiled back at her blue-eyed, good-natured, merry god.

"Where are we going now?" she asked.

Fedor had given the matter a good deal of thought. He remembered Bharati's father saying that if he turned to the right he would reach Karachi, which Persian merchants visited frequently. To turn to the left meant sailing

southeast towards the Portuguese possessions.

The idea of travelling across Persia worried Fedor. Although it was the shorter route he had heard, in Lal Chandra's house, vague rumours that things were not quiet in the land of the Persians.

No, it would be better to sail to Diu. Portugal was far away from Russia and had no reason to quarrel with her.

And so Fedor turned to the left and sailed southeast, following the low coast.

Bharati grew more cheerful. The sea breezes put colour in her cheeks. She boiled rice and baked freshly-caught fish on the hot clay of a small hearth that Fedor had fashioned at one of their stopping places on the Indus. She quickly learned to handle the sails and was soon able to sail the boat single-handed, giving Fedor an opportunity to snatch a few hours of sleep.

The wind rose. Whitecaps rippled and foamed on the high waves. The mast swayed, the boards creaked. The boat lay on its side, the deck half in the water.

Bharati pressed close to Fedor.

"Why don't you go down below?" he said. "You'll get wet."

The girl shook her head. "I'm not afraid of anything when I'm with you."

"Then hold on tight. Otherwise you may be washed overboard. We're going to be shaken up properly."

Fedor knew that it would be far from easy to ride out a storm at sea in their small craft.

But Bharati trusted him, and he would do everything he could to protect her. This was not his first storm at sea. He still remembered how the Caspian Sea had boiled and raged beneath his ship.

With great effort Fedor managed to take down the sail. He folded it and covered Bharati with it.

The wind continued to rise as night fell. The sea was a black, howling wall. It tossed the boat like a nutshell from wave to wave, up and down, up and down.

Fedor's sole aim now was to hold the bow into the waves. If he turned broadside to them, the waves would capsize the boat at once. It was a good thing that Jogindar Singh had followed Fedor's instructions to the letter when making the boat. A boat without a deck or keel would have sunk long since.

With Bharati's help he fashioned a floating anchor. He took down the mast, laid it beside the spanker-boom, wrapped both of them in the sail, and tied the bundle together. He attached one end to a long rope tied to the prow. Then he threw the heavy bundle overboard. The prow immediately swung into the wind. Held by the floating anchor, the boat barely moved and offered the storm no resistance. The raging wind simply streamed around it.

Fedor opened the hatch.

"Down below, quick!" he shouted. He pushed Bharati in front of him and jumped down inside after her, banging down the cover of the hatch and fastening it.

It was dark in the little cabin but at least it was dry and they were out of the wind.

The boat pitched and tossed, up and down, up and down. They lost all sense of time. Had the night come to an end? Or had two nights passed? All they heard was the thunder of the waves and the creaking of the deck boards.

"Are you asleep, Bharati?"

"No."

"Feel all right?"

"Y-yes."

Fedor rose and groped about in the dark, swearing as he knocked his head and banged his knees. Then he struck flint against steel, there was a shower of sparks, and a tiny red glow appeared. Fedor blew on the tinder, lit the oil lamp, and looked at Bharati's pale face.

"Feel all right, dear? Not seasick?"

"No," she whispered obstinately.

The setting sun warmed his back. A northerly wind drove lazy waves ahead of it. The storm was over.

But it did not make any difference now.

Fedor sat in the stern, stubbornly holding the boat to an eastward course. The coastline was still invisible. He had no idea of how many days and nights they had been sailing in the Arabian Sea.

Bharati lay at his knees. That morning he had poured the last drops of water in the pitcher through her parched, compressed lips.

Alas, Fedor Matveyev! You are evidently not destined to reach your native land. Can it really be that you escaped death from lightning in the temple only to die an agonizing death at sea?

Bharati lay with closed eyes. Fedor anxiously bent over her to reassure himself that she was breathing. One thought was uppermost in his mind: I must save her.

Night fell instantly, without twilight. The black sky was soon spangled with bright but remote stars.

The gentle rocking of the boat made Fedor feel drowsy, but he knew that if he fell asleep it would be the end. With a tremendous effort he shook himself awake and swept his eyes across the sea. What was that large reddish star that hung so low in the sky on the port side? Why was it so low? And why did it sway?

Fedor sprang to his feet to take a better look at the star. Why, it was a ship's light!

"Bharati! Wake up! A ship!"

As if to confirm his words the wind brought them the sound of a guitar and snatches of a song.

Fedor jumped down into the cabin. He rummaged about searching for an Indian gunpowder rocket. There it was! He tied it to a stick which he attached to the bow. Striking flint against steel until his hands bled, he produced fire and brought the tinder up to the rocket.

A hissing red arc soared across the dark sky.

CHAPTER TEN

IN WHICH FEDOR'S MYSTERY REMAINS UNSOLVED

The January frost had thickly iced the small windowpanes and was making the pine logs of the walls creak.

It was warm inside the house. The long table standing against the wall was covered with samples of ore, metal and coal, draughtsman's paraphernalia, manuscripts, and vessels containing powders and liquids. In the corner stood a machine which was unique in that part of Russia. It consisted of a lacquered disc covered with shiny strips of metal and set between two supports topped by copper spheres, a belt drive and a handle.

The room was shrouded in semi-darkness. Candles cast a yellow light on a grey head. A goose quill scratched across rough paper. Although the winter evenings were long they were not long enough for Fedor Matveyev. He had not yet succeeded in unravelling the old mystery.

Fedor went over to the machine and turned the handle. With a dry crackle a thin streak of violet-coloured light flashed between the spheres.

He sank into an armchair, folding his lean hands, hands that had swollen veins but were still strong. His thoughts turned to the past.

It had been a long and hard journey from India to Russia. After sailing a seemingly endless time along the coast of Africa the Portuguese frigate had landed them in Lisbon. From there they had travelled by sea and by land, through many countries, without a penny to their name, until they finally reached St. Petersburg. But they had not been able to leave their ship on arrival, for the Neva River had risen and flooded the city. It was said that the tsar himself travelled up and down the flooded streets in a boat, helping to rescue the drowning.

How frightened Bharati had been of the cold and foggy northern city covered with seething water!

Soon after, there came the staggering news of the tsar's death.

Fedor dutifully reported his escape from captivity, but no one had any attention to spare an unknown lieutenant. Those were the days when the succession to the throne was being decided.

Finally someone advised Fedor to go to the new town of Ekaterinburg and see Wilhelm de Hennin, the managing director of a chain of factories in Siberia and the Urals, who was said to be interested in anyone with a knowledge of mining and building.

On the way to Ekaterinburg Fedor and Bharati stopped off at Zakharino to see Fedor's parents. His father and mother were not particularly pleased to have a daughter-in-law brought from overseas. They did not like her long face or her narrow hips, or the fact that she was as dark as a Gypsy and carried herself with dignity. But since their son was going away soon they said nothing. They insisted that Bharati be christened in the local church and that her name be changed to Anna. They gave Fedor some money for his journey; not much, true, but still it was something.

At Ekaterinburg Fedor was made to feel welcome and appointed to the post of chief mechanic. His job was to supervise mining machinery, water-wheels, and dams, and the construction of new factories; also, he was put in charge of the fire brigade. He was given living quarters, and a new life began for him. He performed his numerous duties faithfully.

Russian food and long Russian winters fattened Bharati, made the colour of her skin lighter and put roses in her cheeks. She reared their children and did her household chores conscientiously, making liqueurs and preserves and laying in supplies of honey for the winter. She learned to speak a fairly good Russian. When she and Fedor visited his parents a few years later the old people received her more graciously.

As the years passed the operation of the mines engrossed Fedor more and more. His fair hair became streaked with silver. His children were growing up. Fourteen-year-old Alexander, the eldest son, was preparing to leave for St. Petersburg to enter a military school there.

But he had not yet unravelled the mystery. True, he had discovered what the mysterious force that made the lightning was. Reading all the books he could find on this subject, he had learned that about one hundred years before, in 1650, a certain Otto von Gericke, burgomaster of the town of Magdeburg in Germany, had placed a smooth ball of sulphur on a whirling axis, and by rubbing it between the palms of his hands had made the ball glow and crackle.

In 1709, the Englishman Francis Hawksbee had substituted a glass sphere for the sulphur ball and also produced sparks with a crackle. Mikhail Lomonosov had mentioned this machine in a poem about the many uses of glass.

A revolving glass sphere crackles and makes
flashes of light,
Similar unto those of thunder in the night.

Fedor also discovered that the ancient Greeks had obtained sparks by rubbing a piece of amber with a flannel cloth, and the name of the mysterious force came from the word *electron*, the Greek for "amber".

It was clear that the force in Lal Chandra's lightning machine was electricity, but what a far cry from Hawksbee's harmless sparks! Fedor's disc machine produced far stronger sparks than Hawksbee's ball but it could not be compared with Lal Chandra's machine. How had the Brahman made the electricity so terribly strong that it killed people and caused corpses to quiver?

It was evidently all a matter of being able to accumulate electricity in vessels containing a liquid. With a mental picture of everything he had seen in India always before him, Fedor conducted experiment after experiment with metal vessels into which he poured various liquids and then connected to his machine, but nothing came of it.

During a trip to St. Petersburg Fedor went to the Academy of Sciences to talk with Mikhail Lomonosov, the brilliant young scientist who had recently been appointed professor of chemistry there. Fedor had heard much praise of Lomonosov.

"There is as yet no science of electricity, sir," Lomonosov told him. "But I hope there will be. I advise you to see Richman. He is in charge of our electricity experiments. He is a foreigner, but he does not put on airs. Both Richman and I believe that the electricity obtained through friction is the same force as lightning. We are on the eve of extremely interesting discoveries."

Through Lomonosov's good offices Fedor was able to visit the "chambers for electric experiments", one of the first electricity laboratories in the world.

Richman listened to Fedor's story with interest and made many notes. Like Lomonosov, he was engaged in a systematic study of electricity, particularly atmospheric electricity. Lomonosov was searching for the "true cause of electricity and how to measure it", realizing that a theory of electricity could not be built up without precise data.

In 1753 Richman was killed by lightning while he was measuring the electric force of lightning discharges.

Lomonosov was showered with reproaches and threats.

"They wanted to shield man against God's wrath—lightning—but God punished them for their audacity!" cried his opponents.

Although it took a long time for news to reach the Urals, Fedor closely followed events in St. Petersburg.

"I'd laugh if I didn't feel like crying instead," Fedor remarked to his wife. "Remember how the Brahmans in India made lightning to deceive the people? Russia's equivalent of the Brahmans are angry because others wish to find out what lightning is. If our Brahmans got their hands on electricity they'd very soon reveal their true nature. No, I feel it's a blessing that I did not tell anyone about my experiences in India or about my experiments."

"Please give up your experiments, Fedor dear," said Bharati, alarm in her dark, almond-shaped

eyes. "Ever since Herr Richman was killed I have had no peace of mind."

"No, I won't give up," Fedor said. "If my life is not long enough my children will continue the experiments. They, or their descendants, will live to see a better day."

The candles began to sputter and Fedor trimmed the wicks. The log walls crackled in the severe frost. In the next room Bharati softly sang the same mournful song she had sung so long ago beside the temple of the formidable goddess Kali.

Fedor closed his eyes. People and events of those distant days came to life again in his mind's eye.

The old man chained to the wall in the tower—he had probably carried to the grave his great secret of how to make the human body incorporeal.

The oil that flowed in a long stream through the water of the pool.

The Incorporeal Brahman.

Perhaps he had dreamed it all.

The candles shed a flickering yellow glow on the silvery head. The goose quill scratched on the rough paper.

"I conclude this epistle on the twelfth day of January in the year of Our Lord 1762. I think that if the need should arise it would be best

of all if you were to seek assistance in the Academy of Sciences, from Professor Mikhai Lomonosov, inasmuch as he is well versed in science.

"My last wish, my son, is that the forces of electricity should not come under the power of those insatiable mongrels who are concerned solely with their own personal benefit instead of with the welfare of their country."

3

A HALF-TWIST SPIRAL

Forgive me, Newton!
The concepts you created still
guide our physical thinking,
but we now know that for
a deeper understanding of world relations
we must replace your concepts with others.

Albert Einstein

CHAPTER ONE

IN WHICH CONTRADICTORY OPINIONS OF FEDOR MATVEYEV'S MANUSCRIPT ARE EXPRESSED; REX, NOT HAVING AN OPINION OF HIS OWN, HOWLS IN ACCOMPANIMENT AS YURA AND NIKOLAI SING

"I've deciphered the manuscript and translated in into modern Russian," said Val. "I found it very interesting because the eighteenth century is just my field. Shall I begin?" She looked at Boris Privalov.

He nodded.

They were gathered on the porch of a country cottage with a flat roof and whitewashed walls. The intense heat of late afternoon penetrated through the patterned leaves of the fig tree that grew beside the porch.

Every summer Privalov and his wife Olga rented the same seaside cottage, not far from town. She spent all her time there, while he came out for the weekends.

On this occasion he had brought four guests along without giving his wife warning. They were Pavel Koltukhov, Yura, Nikolai and a girl named Val, whom Olga had never met before; also, there was an enormous, ferocious-looking dog.

They had travelled down in a crowded suburban train and arrived hot and dusty. After a refreshing shower they settled themselves on the porch. Olga brought out platters of grapes and figs.

"Don't trouble yourself now, Olga," said Privalov. "We'll all pitch in later on to prepare supper.

Just sit down and relax. You'll hear a fascinating story."

"Hear ye, brethren, hear ye," chanted Yura, swinging a foot as he sat on the railing of the porch.

Privalov put up a hand to silence him. "All right, Val," he said.

Val opened a red folder, carefully lifted out Fedor Matveyev's manuscript, and laid it to one side. Then she picked up a sheaf of typewritten pages and began to read.

Val read the last word and turned the page over. For a few moments Privalov and his guests sat silent, engrossed in those extraordinary events of two centuries ago, about which they had just heard from the lips, as it were, of Lieutenant Fedor Matveyev of the Russian Navy.

"Thank you, Val," Privalov said softly. He rose and went over to the wall to switch on the ceiling light.

"A remarkably interesting story!" exclaimed Olga. "I can clearly picture him. Do you think it's all really true?"

Pavel Koltukhov snorted. "It's all nonsense," he said. He lit a cigarette and let out a thick cloud of smoke.

Privalov asked Val to read, in the original eighteenth-century Russian, the section in which Fedor Matveyev described how he had first flung himself, knife in hand, on the Incorporeal Brahman. She found that page of the manuscript and read, slowly: "I stabbed him in the heart, but the whole knife, and also my hand along with it, went through his flesh as though it were thin

air. A second later he vanished from the room, passing straight through the closed door. The door was made of wood, at least two inches thick, and was bound in iron."

Koltukhov gave another snort. "Nothing but a fairy-tale." He took the manuscript from Val and neatly copied a dozen lines or so from it into his notebook.

Privalov woke up just as the sun was rising. He tiptoed across the squeaky floor of the porch and down the steps into the garden. The sand was cold under his bare feet. The trees cast long shadows across him as he walked. In a corner of the garden he saw Nikolai, illuminated by the faint rays of the sun, sitting on the low stone barrier of the well. The red folder containing Fedor Matveyev's manuscript lay open on his knee.

"Well, what do you think of it all?" Privalov asked as he came up and sat down beside Nikolai. He yawned loudly. "You didn't say a word all last evening."

"I'm wondering about Matveyev's knife." Nikolai glanced at Privalov. "Why couldn't it be true? Why couldn't they have accidentally stumbled on the specifications of a machine that made matter penetrable?"

"There you go again, Nikolai. Just forget all about penetrability. They didn't know enough two hundred years ago to—"

"But, Boris, by accident, I mean. Fedor Matveyev clearly describes a machine of just this kind in the tower room in which the old man was chained to the wall. He only saw it for

a few minutes and his description is very vague. Here's the place in the manuscript. Listen," Nikolai read slowly: " 'A wire spiral, something like an Archimedes' spiral, cut out of a thin half-twist of silver.' What do you think that half-twist contraption into which the old man thrust Matveyev's knife could have been, Boris? I believe it must have been some sort of a high-frequency output inductor."

Boris Privalov smiled. "It's all very vague, Nikolai, much too vague," he said, laying a hand on the young man's shoulder. "I'm far more interested in the stream of oil that flowed through the pool. Remember? In this case the description of the apparatus is fairly clear. There were big electrostatic generators switched on parallel with electrolytic capacitors of an enormous capacity or, as Fedor Matveyev put it, 'copper vessels to collect the mysterious force'. If they really did make oil flow through water in a compact stream—well, that means they'd solved the problem of a power ray and the building up of surface tension. But those reflectors in the pool, I mean, their shape—"

"Yes, shape," Nikolai said, following his own train of thought. "The shape of the inductor, devil take it!"

"But look, Nikolai. The Hindus just hit on it blindly. But we won't be groping in the dark the way they did. This isn't the eighteenth century, thank goodness. We need a theoretical foundation. I told you what Professor Bagbanly said, didn't I? Let's have no more of this primitive tinkering with spirals. An installation has to be set up, and we'll need your help."

Nikolai nodded. "But what about the manuscript?"

"We'll send it to the Academy of Sciences."

Nikolai closed the folder with an angry gesture and climbed to his feet. "So we just forget about the whole thing, is that it?" he asked bitterly, turning and walking towards the porch, tall, lean and tanned.

Privalov followed him with his eyes, then lifted his shoulders in a shrug.

The beach was crowded, for it was Sunday. The suburban trains spewed city dwellers out of their stuffy carriages by the hundreds and the thousands. All the places under the awnings and umbrellas were occupied; the white sand was thickly covered with tanned bodies.

Boris Privalov and his friends settled themselves at the water's edge, where the sand was a bit cooler. Lazy waves lapped at their feet.

Val put on her bathing cap and waded slowly into the water. Yura and Nikolai plunged into the waves and were soon racing each other to the buoy. Rex, who did not like to bathe, barked at them for a while, urging them to come back, then lay down and stuck out his tongue as far as it would go.

Olga Privalov set up her beach umbrella and lay down in its shade with a book.

Pavel Koltukhov folded a page from a newspaper into a hat which he perched on his head as he stretched out on the sand beside Privalov.

"I'd like to borrow one of your engineers for a couple of days, Boris," he said.

"What for? To dabble in resins?"

"Let me have Jura. He seems a clever lad."

"Certainly. But see to it that he has time to do his own work too."

"Naturally."

"What was it you copied out of the manuscript last night?" Privalov asked a few minutes later.

"Seek and ye shall find," Koltukhov answered vaguely. Then he started telling Privalov how necessary it was to draw up, without delay, a cost estimate of the research involved in the transcaspian oil pipeline project. The murmur of his voice put Privalov to sleep.

Nikolai and Yura came running out of the water, their bodies dripping.

"If Nikolai keeps it up we'll have to put him in a straightjacket, Boris," Yura said as he flung himself onto the sand. "He insists that Fedor Matveyev was telling the truth when he talked about an incorporeal man."

"Oh, shut up!" muttered Nikolai.

But Yura continued: "Anyway, I'm sure I had the last word. I asked him this: if that old wizard really possessed the property of penetrability then why didn't he sink through the ground?"

Privalov lay on his back on the sand, his eyes closed blissfully against the sun.

"Do me a favour, boys" he said in a drowsy voice. "Stop pestering me."

The bountiful sun was spreading hot gold over the beach. Two or three clouds hung in a sky pale from the heat. A suburban train blew its whistle close by, and soon another eager crowd of city dwellers streamed from the station to the beach. They moved in a file along the water's edge, a gay, perspiring throng. Koltukhov grumbled as some of them stepped across his lean shanks.

One of the passersby halted as he caught sight of Koltukhov. Rex raised his head and growled.

"Is that you, Pavel?" the newcomer asked.

Koltukhov looked up. Above him stood Nikolai Opratin.

"Why, hullo there," said Koltukhov lazily, lifting his hand in greeting. "Lured by the sea and the sun too, eh?"

Opratin courteously raised his straw hat to each member of the group in turn, then went off to change into his swimming trunks. When he returned he stretched out on the sand beside Koltukhov.

"What's new, Pavel?"

"Nothing much. We heard an Indian fairy-tale yesterday." Koltukhov then proceeded to give a humorous version of Fedor Matveyev's adventures in India.

"The damned fool!" Privalov thought. "Still, why make a secret of it?" He removed his eyeglasses and went into the water.

Opratin listened to Koltukhov with a smile. But the moment Koltukhov jokingly mentioned Fedor Matveyev's knife the smile vanished and Opratin's face grew strained and attentive.

"Let me interrupt you for a moment, Pavel, but that knife—You say the manuscript describes how it was given the property of penetrability?"

"Oh, that's all nonsense," said Koltukhov. "It's just a fairy-tale. The only thing I can put stock in is the electrostatic generator. That sort of thing was well within the scope of the eighteenth century. By the way—" Here Koltukhov felt he was making a very neat transition to the one topic he wanted to talk to Opratin about. "By the way, I hear you have a powerful electrostatic

generator at your Institute. Mind if I drop in from time to time and use it? I'll try not to impose on you."

"By all means," said Opratin. "What will you be using it for?"

He never got an answer, for Koltukhov launched into reminiscences of his adventurous youth.

Val came running up. She pulled off her bathing cap, shook out her dark hair, and sat down beside Olga.

"Is she the one, did you say, who translated the manuscript?" Opratin asked Koltukhov in a low voice.

"That's right. Would you like to meet her?"

"That was a most interesting find you made," Opratin said to Val after Koltukhov had introduced him to her. "It isn't every day that an original manuscript from Peter the Great's time turns up."

Opratin then entered into a lively conversation with Val. Yura gave them a sidelong glance, called to Rex, and headed for a large rock nearby. Nikolai joined him there. Dangling their feet in the water they began to sing, in mock earnestness, a plaintive old Russian ballad.

"What are you waiting for, Rex?" Yura said sternly.

The dog threw back his head, gave a convulsive yawn, and then began to howl softly in accompaniment.

Val glanced towards the two young men and shrugged.

The dreary song went on and on for a long time.

CHAPTER TWO

IN WHICH NIKOLAI AND YURA DISCOVER THE SKETCHES OF THREE BOXES

As the hardware in Cooper Lane became more and more sophisticated Yura said, with a click of his tongue, gazing proudly around the room:

"Wonderful! Even Faraday never had a home laboratory like ours."

Despite the obvious advantages of the laboratory over Faraday's they were not making any progress worth mentioning. The two young men created electrical fields of various kinds around the "mercury heart", which beat conscientiously but showed no signs whatsoever of increasing its surface tension.

A breakthrough of some kind was definitely needed.

One day Nikolai invited a young engineer from the Institute's automation department named Hussein Amirov to drop in and take a look at the "mercury heart". Hussein spent a whole evening testing the oscillator on different frequencies.

"Nice little toy you've got here," he said to Nikolai. "But there's something wrong with the operating conditions. I'll think about it."

The next morning he phoned Nikolai. "Look here, old man, your mistake is that you're not letting the high frequency through in pulses. You'll have to put in a tuning-fork breaker."

Soon after, Nikolai installed a tuning-fork. An electromagnet kept its prongs in constant vibration, and the contacts on the prongs closed and disconnected the circuit. Movable weights

attached to the prongs regulated the frequency of the oscillations.

Pulses had been a good idea. But Nikolai and Yura could not manage to hit on a combination of high frequency and breaker frequency that would cause the mercury heart, contracted by increased tension, to stop beating. On the other hand, perhaps no such frequency existed at all.

One evening the two were busy as usual with their installation, experimenting with a new series of frequencies. And as usual, the results were disappointing.

"We can sit here from now to doomsday and still neither of us will ever be another Faraday," Yura said to Nikolai, pushing back his chair noisily.

"You're right," Nikolai agreed with a sigh. He shook his fist at the "mercury heart". Then he took out Fedor Matveyev's manuscript from his briefcase. He had borrowed it from Privalov for the evening. It was to be sent to Moscow the next day with an accompanying letter by Professor Bagbanly.

"Is the half-twist spiral in that manuscript still preying on your mind?" Yura said. "What do you think it might lead you to?"

"You know what as well as I do. If we could increase the surface tension of liquids it means—"

Yura waved his hand impatiently. "I didn't have that in mind. According to Fedor Matveyev the knife acquired penetrability after the old man who was chained to the wall thrust it into that spiral. Do you really think—"

"I don't think anything. All I want is to find a new form of inductor." Nikolai carefully turned the pages of the manuscript.

"Let's have a look at the last page, where he writes about Mikhail Lomonosov," said Yura.

They read in silence for some time.

"That damned half-twist spiral!" Nikolai exclaimed, rummaging in his pockets for his cigarettes. "What are you doing that for?" he asked Yura, who was holding a sheet of the manuscript up to the light.

"Look! Some sort of drawings."

Pencil lines were visible on the back of the last page. The lead had rubbed off almost completely, only the faint traces of lines pressed into the thick paper by the point of a hard pencil could be seen.

"Why, that's our box! But there's more than one."

A firm hand had drawn three boxes, one below the other, and indicated their sizes. Two of them looked like the box in which Fedor Matveyev's manuscript had been preserved, while the third was square and flat. There was an inscription under each drawing. All three boxes bore the letters *A M D G*, evidently meant to be engraved. Below the letters was a drawing of a crown, and below that, in smaller script, the letters *J d M*.

"Our box should have the same letters on it, don't you think?" Yura picked up the box and examined it. "Yes, here they are. We didn't notice them before because the lines were filled with rust."

Nikolai frowned. Where had he seen those letters before? He went over to the bookcase and

ran his eyes over the titles on the backs of the books. Finally he pulled out *Vicomte de Bragelonne* and started leafing through it.

"My memory didn't let me down," he remarked with satisfaction. "Listen: 'Bewildered, Baizemeaux de Dmoutlezun leaned over his shoulder and read, *A M D G*...'."

Taking the book from Nikolai, Yura read aloud the footnote, a grin on his face: "'*Ad majorem Dei gloriam.* To the greater glory of God. The motto of the Jesuits.' But what's *J d M*? It isn't in the book. What a lot of puzzles Lieutenant Fedor Matveyev has given us to solve!"

"We need a system," said Nikolai. He took a sheet of paper and quickly wrote:

Boxes	Inscriptions	Size of boxes in drawing		
		Length	Width	Height
1	La preuve	9	$1^3/_4$	$1^3/_4$
2	La source	$9^1/_2$	2	2
3	La clef de mystère	4	4	$^1/_2$

Yura rubbed his hands vigorously. "That's a good idea. Now we'll translate the inscriptions. Call up Val. She knows French."

"Well," Nikolai said after talking with Val, "*la preuve* means 'the evidence', *la source* means 'the source' and *la clef de mystère* means 'the key to the mystery'."

"The key to the mystery, you say?" Yura took a caliper and measured the height, length and width of the iron box. "It's 257.5 by 54.2 by

54.2 millimetres. Get out your slide-rule and calculate the ratio. Divide 257.5 by 54.2."

"It's 9 1/2 by 2 by 2," said Nikolai. He glanced at his chart. "Our box with the manuscript is the one called 'the source'."

"Well, that's clear," said Yura. "Now, what's the unit of measurement used in the drawings? If we divide 54.2 by two we get 27.1 millimetres. The English inch is equal to 25.4 millimetres. So—"

"So it isn't in inches. We'll come back to that later. Now let's systematize what we know."

They drew up another table:

Inscriptions	Size of Boxes						Remarks
	In the scale on the drawings			In millimetres			
	Length	Width	Height	Length	Width	Height	
Evidence	9	$1^3/_4$	$1^3/_4$	243.9	47.4	47.4	Missing
Source	$9^1/_2$	2	2	257.5	54.2	54.2	Our box
Key to the mystery	4	4	$^1/_2$	108.4	108.4	13.55	Missing

"Someone put the manuscript in the box that finally came into our hands and ordered two more boxes, one for 'the evidence' and the other for 'the key to the mystery'. It probably wasn't Fedor Matveyev. It's hardly likely he would go in for Jesuit mottos. Who was it, then? What's hidden in the other boxes? And where are they?"

Yura and Nikolai spent a number of evenings in a fascinating search for the key to the enigmatic inscriptions. *A M D G* told them that Jesuits had been directly involved in the affair. What the letters *J d M* meant, though, was a complete mystery.

In the public library they found a book on heraldry from which they discovered that the crown on the boxes was a count's crown. They realized that *J d M* were the initials of some count, the "d" standing for "de".

Next they settled down to read everything they could find about the Jesuits.

Yura and Nikolai had a big notebook in which they entered all kinds of information on things like radio circuits, photography hints, sailboat designs, poetry, designs of scuba gear and underwater guns, data on surface tension and so on.

Now they put into it copies of the drawings of the three boxes with the following commentary:

(a) The old French inch is equal to 27.1 millimetres.

(b) This inch was abolished in France on the 19th Frimaire in the eighth year of the Republic, that is, on December 10, 1799, when the metric system was adopted.

(c) The inscriptions were made in a pencil with a lead of ground graphite mixed with clay and baked, much like modern pencils. Pencils of this type appeared after 1790.

Deductions

1. The type of pencil shows that the inscriptions were made after 1790. The measurements were made before 1799, when

the metric system was introduced, or possibly after, since it took a long time for the metric system to come into general use.

2. The letters *A M D G* indicate that the person who put Fedor Matveyev's manuscript in the box belonged to the Society of Jesus. He was a count and his initials were *J d M*.

3. The box was found on the territory of the Russian Empire, from which the Jesuits were expelled by Tsar Alexander I in 1820. Between 1803 and 1817 the Ambassador of the King of Sardinia to Russia was Count Joseph de Maistre, an important Jesuit, and the *J d M* could have been his initials. He was a mystic and an obscurantist who was unlikely to have recognized the metric system introduced by the godless Convention but was quite likely to have used a new-fangled pencil with a lead of ground graphite.

4. Fedor Matveyev could not have lived until the year 1803. Only a grandson or a great-grandson could have been alive and grown-up between 1803 and 1817.

General Conclusions

The information in Fedor Matveyev's manuscript about electricity and the uses to which it was put by an Indian religious sect came to the notice of Count de Maistre, the Jesuit, betweeen 1803 and 1817, and aroused his interest, probably because he thought it might benefit the Society of Jesus. For some reason, the Count hid the

manuscript in a little iron box and engraved the initials of the Jesuit motto and his own initials on the box. He named the box 'The. Source', evidently meaning 'the source of information'.

In addition, the Count ordered (or intended to order) two more boxes. We know their dimensions. One box, almost the same size as the box which Boris Privalov found, was to contain 'The Evidence'—but we do not know of what—and the other, a flat box, was to be for 'The Key to the Mystery'. The third box may have contained the results of experiments to unravel the secrets of the Indian Brahmans that Fedor Matveyev described."

"Not bad at all," said Boris Privalov when Nikolai and Yura showed him the notebook. "It's all quite logical. But where do you go from here?"

"We'll start a search for the other two boxes," Nikolai replied.

"Should we make inquiries of the Society of Jesus?"

"That would be going too far. We'll confine ourselves to the bazaar meanwhile."

"The bazaar?" Boris glanced questioningly at Nikolai. "But of course! That's the only link you have, isn't it? You'd better not delay. I heard it's going to be closed down for good very soon."

The bazaar's "hardware department" was practically deserted and Nikolai and Yura quickly found the man they had dealt with before. It took

them some time to convince him they were not guardians of the law. Only then did he confess that the iron bar which Privalov had bought was part of a batch of junk obtained illegally from a state-operated scap metal depot.

A delicate and tactful interview with the man in charge of the depot led to an introduction to the crew of waste disposal truck No. 92-39. The crew immediately took Nikolai and Yura for detectives. The two young men did not bother to disillusion them.

The driver and his assistants studied the iron box, talked it over for a long time and finally recalled the address of the house where a family had thrown out a great deal of junk just before moving into a new flat.

Yura and Nikolai found the house. A loquacious concierge told the amateur detectives that one of the tenants had indeed moved out early in summer. His name was Benedictov. He had discarded a lot of old things when he moved. The neighbours had always complained of his experiments at home for they had inevitably short-circuited the electricity. She could give them his new address.

When the door opened, Yura later said, Nikolai tensed all his muscles for flight. Rita was no less amazed to see the two young men.

Yura was the first to recover. "Please excuse us," he said in an unnaturally loud voice. "May we see the master of the house?"

"He's not in. What do you want to see him about?"

Nikolai opened his mouth to say something but all that came out was a hoarse sound. Yura hastened to his rescue.

"We'll explain what it's all about, but talking here in the doorway is somewhat inconvenient."

Rita led her uninvited guests into the flat.

"My name is Yura Kostyukov," Yura said, "and this is my friend Nikolai Potapkin."

"I'm Rita Benedictov."

Yura was beginning to feel quite at home. "You go in for diving, don't you?" he said in a casual, friendly tone.

Rita frowned. "What did you want to see my husband about?"

"We'd like to know if you had a small iron bar in your old flat. Not really a bar, though, but a metal box with Latin letters engraved on it."

"Latin letters?" Rita repeated slowly.

"Yes. The letters aren't very large and they're filled in with rust. The box isn't much bigger than this." Yura marked off a rectangle on the green tablecloth with his finger. "The thing is that the box contained an eighteenth-century manuscript. We found the box quite by chance in a pile of junk at the bazaar. The man who sold it to us said it came from a house in Krasnoarmeiskaya Street. There we were told you had thrown out a lot of old junk when you moved. You did live in Krasnoarmeiskaya Street, didn't you?"

Rita did not reply. As she stood there beside the table the lamplight gave her hair a golden sheen.

"We've discovered that there should be two more boxes," Yura went on. "We don't know

what's in them, but we may assume whatever is there will have either scientific or historical value." All of a sudden his patience came to an end. "In brief," he said, "if you're the one who threw out that box maybe you can tell us where the other two boxes are."

"Two more boxes, you say?" Rita asked thoughtfully.

"That's right, two more."

She looked Yura straight in the eye and said firmly: "You're quite mistaken. We did live in Krasnoarmeiskaya Street before we moved into this flat but we did not discard any small metal boxes."

"What a pity," said Yura after a moment. "Please excuse us for having taken up so much of your time."

They hurried downstairs. When they were outside, in the street, Yura gripped Nikolai by the arm.

"We're on the right track!" he exclaimed. "She knew the box we were talking about but she hadn't known there was a manuscript inside it. She thought it was just a solid bar of rusty iron and she threw it out. Now she's sorry."

Nikolai said nothing. He was wondering why Rita's face seemed so familiar.

Yura shook him by the shoulder. "Wake up, you miserable creature. There's a mystery here, and as sure as my name is Yura I'll get to the bottom of it. Together with you, right?"

It is hard to say which caused a greater stir at the Institute—the transcaspian pipeline project or Fedor Matveyev's manuscript. Following

Privalov's detailed report to the staff about the manuscript, debates raged in the departments and laboratories over the Incorporeal Brahman and the stream of oil flowing through water. Many linked up the stream of oil with the Caspian pipeline problem. The more fervid imaginations gave birth to fantastic plans. The wildest and most hare-brained schemes were put before Privalov. Some he discussed, while others he angrily dismissed as ridiculous.

"What have I done to deserve this?" he grumbled. "The pipeline across the Caspian will be built of the most ordinary pipes—I repeat, ordinary pipes."

That was the honest truth. But it was also true that Professor Bagbanly had visited the Institute several times in the evening and had had long talks with Privalov. It was true, too, that a surprising machine was being built in one of the rooms in Privalov's laboratory. Engineers Yura and Nikolai, and also Valery Gorbachevsky, the lab technician, could have told something about it, but they had strict orders not to divulge any information.

Pavel Koltukhov was displeased by all the feverish and far-fetched schemes being hatched at the Institute. The most stubborn debaters were invited to his office, where he first heard them out and then cooled their ardour with a stream of caustic remarks.

Meanwhile, Koltukhov continued to work on his resins. Sometimes, after synthesizing a new compound, he would step across the street to the Institute of Marine Physics and drop into Opratin's laboratory. He would melt the resin in a mould and place it between the plates of

a capacitor linked up with a powerful electrostatic machine. While the resin was being charged Koltukhov chatted calmly with Opratin about this and that and related episodes from his life.

"Does your resin hold its static charge long?" Opratin asked him one day.

"That depends on how I charge it. Your chief told me you are setting up an installation with a Van de Graaff generator on an island somewhere. Now if we were to charge the resin from that generator—"

"I'm afraid you'll have to wait some time for that," Opratin smiled. "We've just begun installing it."

Pavel Koltukhov had his heart set on a strongly charged resin that could be used to insulate underwater pipelines. He believed that a thin insulation layer having a static charge could prevent corrosion more cheaply and reliably than the many layers now used to cover the pipes.

"I knew about the properties of electrically charged resins before, but it never occurred to me before," Koltukhov said. "Fedor Matveyev was the man who gave me the idea."

"Fedor Matveyev?"

"Remember the eighteenth century manuscript I told you about on the beach?"

Opratin's expression grew guarded and his eyes flickered. "Why, yes, of course. But what's the connection?"

"Matveyev wrote that the Hindus carried some kind of resin up into the mountains," Koltukhov said slowly. "They left it for a time on high peaks, where it received what they called 'heavenly strength'. This gave me the idea that

the Hindus might have been using the energy of cosmic rays without actually being aware of it. There would be plenty of cosmic radiation at high altitudes. They must have had some excellent resins, which they turned into highly charged electrets."

"Highly charged electrets," Opratin repeated softly, tapping his fingers on the table. "Yes, that certainly has possibilities."

In the twenties of the present century two Japanese researchers discovered that some resins become charged and turn into permanent and quite new sources of electricity after having been melted and left to cool in a strong electrostatic field, between the plates of a capacitor. Like a magnet, they pass on their properties without losing them. These were electrets. If an electret is cut in two, new poles will arise at the new ends.

Yura found himself spending more and more of his time in Koltukhov's resin laboratory. He liked making new compounds according to Koltukhov's formulas and measuring the electricity in the charged resins.

One day Koltukhov sent Yura over to Opratin's laboratory to charge the latest batch of resin.

Opratin greeted Yura pleasantly, showed him the electrostatic machine, and helped him to switch it on.

Yura looked about with curiosity. There were several people in white overalls at work in the laboratory. One of them, a thickset man with

a shaggy head of hair, sat with his back to Yura, at a table on which an aquarium with a wire coil round it and a valve oscillator stood.

"Are you doing high frequency experiments?" he asked casually.

"Oh, that's just a minor project," Opratin replied with a keen glance at Yura. "Are you interested in high frequencies?"

"No, not particularly."

A tall, husky man in blue overalls entered the laboratory. To Yura's surprise, this was Uncle Vova Bugrov.

"Comrade Benedictov, here's the food for your fish," Bugrov said to Anatole Benedictov in a deep, hoarse voice.

The shaggy-haired man sitting beside the valve oscillator turned round, nodded, and took the two paper bags Bugrov was holding out to him. Yura was unable to shift his gaze from the man's broad face and puffy eyelids.

"Why, hullo," said Bugrov shaking Yura's hand. "What brings you to our Institute?"

"Do you work here?" Yura asked in surprise, his eyes still fixed on Benedictov.

"I'm a laboratory technician. I've switched to science now. They think very highly of me here. You know, I'm training a group of scientific workers in wrestling."

"What does Benedictov do here?" Yura asked in a low voice.

"Benedictov? He's a scientist. He knows all there is to know about fish. Shall I tell you what else I'm doing?" Bugrov asked boastfully. "I'm an inventor, if you want to know. I'm making an electric dynamometer. What d'you think of that?"

After charging the resin Yura rushed back to his own Institute and ran up the stairs two at a time.

"There's news, Nikolai," he shouted. Panting, he told Nikolai about seeing Benedictov, about the valve oscillator and about Vova Bugrov.

Nikolai ran the palm of his hand across his high forehead. "High frequency—and fish? I wonder— But Opratin is studying the level of the Caspian, isn't he?"

"Benedictov's the man to ask about the iron boxes."

"You think he'd tell you?"

During the lunch break Nikolai remained in the deserted laboratory. Sitting at his desk, he cut a thin strip from the sheet of drawing paper on his board. He pinned one end to the desk, twisted the other in a half-curl, and glued the ends together.

He sat for a long time staring, in deep thought, at the twisted piece of paper. Then, with a pencil, he drew a line along the edge of the paper until it came full circle. The line ran round both sides of the strip of paper, without Nikolai either lifting his pencil from the paper or crossing the pencil line at any point. This strip of paper was the model of a mathematical paradox known as the Möbius band. From the mathematical point of view the band had no thickness and its surface was not divided into outer and inner surfaces. It was only a surface, and nothing more. A window that mathematics had opened up into the sphere of the Unknown.

Nikolai made a second strip twisted in the same direction and tried to put it inside the first one, but this proved to be impossible. By

trying to put one strip into another he would have to bring the inner surface of one towards the outer surface of the other. But if neither had an outer surface or an inner surface how could he do this?

Nikolai flung the strips on the table and propped up his head on his hand. "What if I made a similar spiral out of copper and linked it up to the output circuit of an oscillator?"

He went out to the lounge, pulled Yura away from a game of table tennis, and said: "Do you remember a thing called the Möbius band?"

CHAPTER THREE

IN WHICH THE SAME BRIGHT IDEA, NECESSITATING FEDOR MATVEYEV'S KNIFE, OCCURS TO BENEDICTOV AND OPRATIN

"At last!" Opratin exclaimed, running his eyes across the letter, which was typed on an official letterhead.

Ever since summer, Opratin's imagination had been fired by the letters *A M D G* on Benedictov's box that had contained the missing knife. When Benedictov showed him the box Opratin had immediately recalled the old underground passage in Derbent, the crucifix on the chest of the skeleton, and, lying beside it, the small flat box on a golden chain, with the letters *A M D G* engraved on it.

From what Pavel Koltukhov had said Opratin now knew that there were three boxes, and that the third box, the one in Derbent, contained some sort of "key to the mystery".

Opratin had written a number of cautious

letters, first to Derbent and then to Moscow, after learning that the agent's equipment had been sent there. Now the long-awaited reply was in his hands. The agent had been a submarine officer in the Italian Tenth Torpedo-Boat Flotilla, notorious for its sudden raids on British naval bases with mines guided by frogmen.

Part of the Tenth Flotilla had been transferred to the Crimea in 1942. When the nazis broke through to the North Caucasus part of the Flotilla had concentrated submarines and frogmen-guided torpedoes at Mariupol on the Sea of Azov for transfer to the Caspian Sea.

Vittorio da Castiglione, an officer of the Tenth Flotilla, parachuted down onto the Caspian coast near Derbent on a dark autumn night. His mission had probably been to reconnoitre the underwater approaches to the port of Derbent and note installations that could be attacked with guided torpedoes. But he had wandered into an old quarry and had perished there. Nobody would ever have learned about Vittorio da Castiglione if Opratin had not stumbled over him.

"To recapitulate," Opratin said to himself, "one box contained Fedor Matveyev's manuscript and another the knife. But what was in the third box? Probably something very important that would throw light on the entire mystery."

Well, he'd soon know what it was all about.

Nikolai Opratin rubbed his hands in satisfaction.

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The Institute of Marine Physics was making preparations to raise the level of the Caspian Sea. This undertaking was based on the extremely simple proposition that a heavy rain can produce

one and a half millimetres of precipitation in one minute. If rain poured down constantly on an area of thirty square kilometres of the Caspian day in and day out, the level of the sea would rise three metres in the course of a year. Water for the downpours would have to be "borrowed" from the Black Sea, where there were plans to build a powerful nuclear water boiler. A new Soviet method of obtaining nuclear energy made such an installation possible.

As a gigantic fountain of steam gushed forth from the depths of the Black Sea a system of directional antennae would force the endless grey cloud to snake its way over the Caucasus Mountains. On reaching the downpour area in the Caspian Sea the cloud would enter the zone of a powerful electrostatic field. Here the concentrated steam would lose its heat, be converted into water, and pour down on the sea.

Laboratory No. 8 was setting up cloud condensation experiments, and this kept Opratin, as head of the laboratory, very busy indeed. The installation had given him a good many sleepless nights. Erection of the installation on a remote, uninhabited island in the Caspian was nearing completion. Opratin was personally supervising the operations. He had in mind certain other plans that were linked up with this installation.

The two new members of the staff introduced a somewhat disharmonious note into the carefully planned arrangements in Opratin's laboratory. Shaggy-haired, absent-minded Anatole Benedictov spilled reagents from bottles on the tables, broke a great many vessels and often caused short circuits. He argued with Opratin

in a loud voice. Yet Opratin was patient with him, and this was what aroused the greatest astonishment.

With Benedictov's arrival the "fish problem" suddenly loomed large in the Institute programme. At any rate, it occupied all the best places in the corridors, for that was where Anatole Benedictov had set up his aquariums. He plagued the assistant manager in charge of supplies with demands for various types of food for his fish.

Feeding the fish was one of the duties of the new lab technician, a husky, rosy-cheeked man with slits for eyes and a tuft of reddish hair on top of his head. This was Vova Bugrov. Bugrov very soon felt quite at home in the world of scientific research. As one watched him puttering about beside the spectrograph, softly humming a popular tune, one felt that the delicate cassettes were doomed.

"I wonder why Opratin ever took this chap on as a technician," staff members asked one another. "He looks more like a gangster than anything else."

To everyone's surprise, though, the new technician turned out to have a light touch; his huge paws handled the precise instruments gently and deftly. Bugrov could do a marvellous soldering job. He put great effort into developing the spectrograms, and he kept a detailed journal (with spelling mistakes in it, true) of the functioning of the various lab instruments and machines. This was more than even Opratin had expected from Bugrov.

The motorboat skimmed across the bay towards the open sea. Prow lifted high, it left behind

a pair of long, spreading, foamy moustaches. It was a calm, sunny morning in October, with a slight chill in the air.

Bugrov, his cap pulled down over his forehead, sat beside the outboard motor. Suddenly he pricked up his ears. Above the steady roar of the motor he caught snatches of an interesting conversation.

"No, I don't think they know about the knife," said Nikolai Opratin.

"Then why did they come asking to see me?" Anatole Benedictov retorted. "They asked questions, Rita says, about three small iron boxes. But why three? One contained the knife; in the other, you say, they found a manuscript. But where does a third box come from?"

"That's my business."

Opratin wrapped his raincoat more closely round him. Benedictov tried to light a cigarette but every time he struck a match the wind blew it out. He swore as he kept tossing matches into the water.

On reaching the island they guided the boat into a cove with a gently sloping shore. Bugrov cut the motor and nimbly jumped out onto the damp sand. He tied the painter to a length of pipe he had driven into the sand on an earlier visit to the island.

Here, on this desolate little island, Laboratory No. 8 of the Institute of Marine Physics had set up an experiment facility.

Two months ago a blunt-nose self-propelled barge had pulled its flat belly up onto the sandy shore, and a tractor, followed by a crane on crawler treads, had rolled out of its dark interior with much clanging.

An old concrete pillbox built on the island during the war had been converted into a pilot plan for cloud condensation.

Benedictov and Opratin climbed to the top of the low but steep rise and disappeared inside the former pillbox. Bugrov remained on the shore. He walked up and down the sand for a while to stretch his legs, then sat down on a rock to think.

There was plenty to think about. For two months now he had been punching the clock, something he had never done before in his life—and what was he getting out of it? Where was the knife for which he had agreed to take on the job of lab technician?

It was becoming embarrassing. Friends were laughing at him. A steady, full-time job, of all things! In science, too! It was time he gave up working like a horse, they said.

Bugrov couldn't have agreed with them more. He would give it up—just as soon as he finished his dynamometer. It would be a beauty! All you'd have to do was step on the footboard and flex your muscles, and the machine would show you how strong you were. There would be no lights or bells, like in the ordinary dynamometers. This one was strictly scientific.

All of a sudden Bugrov grew angry with himself. What was he thinking about? The knife was what he needed! Then he would be able to tour provincial towns with an astonishing knife act.

He scrambled up the rise and approached the pillbox. After opening the inclining steel door he entered an underground passageway lined with shelves holding storage cells. The passageway

led into a round room with a domed ceiling. An internal combustion engine stood there. From this room Bugrov passed through a narrow doorway into what had once been the casemate.

The room was crowded with laboratory equipment. Red-hot filaments glowed in an electric fireplace. Nikolai Opratin and Anatole Benedictov sat at a table under a bright light.

Bugrov marched to the middle of the room and stood there, hands in pockets, his padded jacket flung open. His face wore an insolent expression. "You promised me the knife," he said. "When will it be ready?"

Opratin drummed his fingers on the table. "Look here," he said in an even voice, "if you get on my nerves you'll never lay eyes on the knife at all. Can't you see we haven't set up all the equipment yet? Be patient."

"I'm patient, all right," Bugrov replied defiantly. "Too patient, in fact. I'm just warning you. You'd better speed things up."

"That will do. Instead of complaining you could put your energies to better use by tinkering with the power generator. You're the one who will be servicing it."

Bugrov pushed his cap to the back of his head and left the room.

The mutiny on the island had been put down.

"I can't see why you have anything to do with that gorilla," Benedictov remarked.

Opratin shook his head. "Rank ingratitude, I call it. That gorilla is the person who gets you those ampoules you're so fond of."

Benedictov said nothing.

"He's right. We'll have to speed things up," Opratin went on. "We won't be here alone forever. We'll have to start work on cloud condensation

as well, and that means researchers will be coming here to work. I shan't allow them to see the equipment in the room below, of course, but still— Anyway, I have an idea." He told Benedictov of his talk with Pavel Koltukhov, about the episode mentioned in Fedor Matveyev's manuscript and about the electrets.

"Don't you see? The Hindus may very well have used electrets as a source of energy. Electrets have a peculiar property to which I have given a great deal of thought."

"Namely?"

"A shift in polarity. Sometimes an electret begins to lose its charge within a few hours. The charge drops to zero and then increases again, but now the positive and negative poles have changed places. An electret with altered poles will exist for an indefinite time. Sometimes this happens and sometimes it doesn't. What changes take place in the substance of the electret? What is this zero threshold across which its charge passes? That's the question."

"A magnet magnetizes other substances without losing its properties. An electret charges other substances without losing its charge," said Benedictov. He was speaking with his eyes closed, concentrating on his words. "Splendid! That confirms my idea. What we must do is set up an installation in which the knife will transmit the charge. The knife will charge other bodies with its properties, will remake their structure to resemble its own. To put it more exactly, the knife will transmit penetrability."

Opratin stared at Benedictov in silence for a few seconds.

"Transmit penetrability," he repeated in a low voice. "Use the knife as a transducer. That's a brainwave!"

Benedictov coughed to clear his throat and then amplified his idea.

"It's a brainwave!" Opratin repeated, striding up and down the room. "Do you mean to say we can do it with living material too?"

"Exactly. My experiments with fish make me confident of success."

Opratin stopped pacing the floor. "To sum up, we'll make an electret with switched polarity that will create a permanent field. We'll intensify the field with a powerful charge of static electricity, using our Van de Graaff generator. We'll set up the installation in such a way as to make the fields intersect. We'll place Fedor Matveyev's knife, the transmitter of the 'charge,' at one intersection and an ultrashort wave radiator at the other. It will be a kind of cage in which we'll put some of your fish, or maybe dogs. Or anything else, for that matter. We'll keep changing the field intensity and keep on experimenting until we hit on just the right angle!" Opratin's eyes sparkled. He was so excited that he could hardly stand still. "Yes, we'll force that knife to transmit its properties to another object!"

Arguing and interrupting each other, the two scientists proceeded to sketch designs of the future installation. Suddenly Benedictov flung aside his pencil and rose, his joints creaking.

"The knife," he said. "We must have the knife. We won't get anywhere without it. I don't think you're searching for it the way you should."

"I've combed the sea floor at that place three times." Opratin stopped, then added in a lower voice, "Is there any reason why your wife should want to hinder our work?"

"Hinder our work? No, although lately she's been urging me to drop my experiments. But that's all. Why do you ask?"

"Because the knife doesn't seem to be at the bottom of the sea. I have a feeling your wife is concealing it."

Benedictov's face grew long. "Impossible. Why should she do that?"

"Why should she try to persuade you to give up this line of experiments?"

Benedictov did not reply. The electric fireplace threw red shadows across his gloomy face.

"Never mind, you leave the knife to me," Opratin said. "I'll get it."

CHAPTER FOUR

IN WHICH VALERY GORBACHEVSKY'S LITTLE FINGER PLAYS THE LEADING PART

Nikolai and Yura were now completely engrossed in the enigmatic Möbius band. Their catch-all notebook was filled to overflowing with formulas and sketches of intertwined bands.

"Your idea of using one side is marvellous, Nikolai!" Yura exclaimed. "I'm sure the Möbius band will give us the field we need. Imagine! No pipes! A stream of oil flowing straight through the sea!"

Yura's enthusiasm was infectious. "I've estimated," Nikolai said, "that doing away with

pipes to transport oil across the Caspian would save about 25,000 tons of steel."

"But that's not the main thing," Yura said impatiently. "We'll learn to control surfaces. It'll be an epoch-making discovery!"

"Now don't let our imagination run away with you," Nikolai remarked. "We aren't in that class at all. With our limited resources we can only set ourselves a limited goal like increasing the surface tension of a drop of mercury. If we succeed we'll try to do the same with oil."

Yura grew downcast. "Is that all?"

"No, not quite. Don't spread this all over the Institute and don't say anything, meanwhile, to our chief. Is that clear?"

"Yes, strictly confidential," Yura said with a sigh. "The Inquisition put the same kind of pressure on Galileo."

The evenings in Cooper Lane were now a busier time than ever. Yura and Nikolai had enlisted the services of three young engineers from the automation department, who helped them to assemble intricate electronic circuits. They often blew the fuses and then had to go out with a candle to repair the damage. Luckily, Nikolai's mother was a patient, kind-hearted woman.

One day lab technician Valery Gorbachevsky took Yura aside. "Need any help evenings?" he asked.

Yura stared at him. "How do you know what we're doing after working hours?"

"I'm not deaf, am I?"

"All right, drop in tomorrow at eight. Just keep whatever you see under your hat. Don't mention it to Privalov. What we're doing at home is our own private concern."

Valery nodded.

"After all, Faraday was once a lab technician too."

"Faraday? A lab technician?"

"That's right. Not here, of course, but at the Royal Institution of Great Britain. As you can see, a big future lies ahead of you."

That evening Yura, a guitar slung over his shoulder, strode briskly down Cooper Lane and turned into the courtyard of Nikolai's house. A series of what sounded like gunshots came from the other side of the archway, where a tall, plump woman was beating a carpet. At sight of Yura she gave a broad smile. "Haven't seen you for a long time," she said.

"Good evening, Claudia," said Yura.

"Is Nikolai throwing a birthday party?" she asked. "Guests keep coming and coming. Young people, all of them." She smiled again. "My Vova is doing scientific research too nowadays."

"Well, give him my best regards." Yura smiled politely and ran up the steps two at a time. He flung open a door from behind which came voices and laughter. Everyone was there. Nikolai and the three other young engineers were tinkering with the instruments. They had the efficient assistance of Valery, who never suspected he was destined to be the hero of the day.

"What held you up?" asked Nikolai.

"Uncle Vova's wife stopped me for a chat and asked me to pass on her very best regards," Yura replied.

"Why the guitar?"

"I'll sing you some songs."

"Stop twaddling. Come on, let's check the connections."

"I'll tell you why I brought the guitar." Yura's tone was now serious. "Our tuning-fork generator is made to oscillate by an electromagnet, isn't it? But the electromagnet means an extra magnetic field, in other words, frequencies that we don't need at all. So I thought—"

"That's right," swarthy Hussein Amirov put in. "A guitar can do the work more simply than an electromagnet."

The installation stood on a big table behind blue draperies. It consisted of the original mercury heart and valve oscillator with a tuning-fork breaker, to which a twist of copper tubing, an enormous Möbius band, had been added. The output circuit of the valve oscillator was connected to coils surrounding the band. The scales containing the mercury heart stood inside the band.

The one-sided Möbius band was expected to produce a field which would sharply increase the surface tension of the mercury and squeeze it so hard that it would stop pulsating. Then, by adding mercury until the heart started beating again they would be able to calculate, from the additional weight, the extent to which surface tension had been stepped up. Once they hit on the right combination of frequencies they could start experimenting with oil.

Nikolai switched on the battery of capacitors. To do this he had to crawl under the table and disturb Rex, who was sound asleep there.

As Yura checked the connections the neon bulb in the handle of his screwdriver glowed with a twinkling pink light from time to time.

"All systems functioning," Yura finally declared. "Breaker frequency is 440 hertz."

"*Ting, ting, ting,*" went the tuning-fork gently in the silence of the room.

Yura hurriedly tuned his guitar. Next they adjusted the tuning-fork breaker by moving the weights on its prongs.

Now all they had to do was touch a guitar string, and the contacts of the tuning-fork breaker would begin to break the high-frequency circuit at the rate of 440 times per second.

The mercury heart beat quietly inside the mysterious field of the Möbius band. Our experimenters knew, of course, that a long, boring search lay ahead of them. They knew that an experiment rarely yields the desired result the first time. Still, deep down inside there was the hope that perhaps today a miracle would take place.

It didn't.

"We'll have to vary the operating factors," said Nikolai. "Will you strike *B* on the tuning-fork, Valery?"

Ting-ting-ting.

Yura plucked a guitar string.

There was silence, broken suddenly by a sharp knock on the door.

"Who could that be?" Nikolai wondered. "Mother said she wouldn't return home until late."

The young men moved away from the installation and drew the draperies to hide it from view. Only Valery, with his tuning-fork, and Rex remained behind the draperies.

"Let's liven up the party!" shouted Yura. He plucked the strings of the guitar, took a few dancing steps, and began to sing:

Why do you wander in the moonlight,
Oh black-eyed beauty of mine?
Powder in your pocket to poison me with,
A locomotive in your pocket to crush me with.

Nikolai opened the door and Vova Bugrov, in a striped blue pyjama top, came in.

"Hullo, everybody," he said politely, letting his eyes roam about the room. His glance rested on the blue draperies and on the scraps of wire scattered on the floor. Then he shook hands with each of the young men in turn. "Having a party?" he asked. "That's fine. I'll take only a minute of your time, Nikolai." He pulled a rusty spring out of his pocket. "Will you calculate its strength, please?"

"You said you'd switched to electric dynamometers," said Yura.

"So I have," Bugrov replied with dignity. "This is just something—well, to make a long story short, a couple of pals dropped in and asked me to help them."

Nikolai quickly measured the diameter of the spring and the wire to which it was attached, and then took out his slide-rule.

"Twenty-eight kilograms."

"Thanks." Bugrov picked up the spring and moved towards the door.

At that moment there was a crash behind the draperies. The young men exchanged glances. Vova swung round and stared at the draperies. Rex emerged from beneath them, his paws tapping the floor. He stretched and then sniffed at Bugrov's shoes.

"Go away, dog," said Bugrov, backing towards the door. "I don't like being sniffed at."

Nikolai saw Bugrov out and locked the door

behind him. Yura struck another few chords to be on the safe side. Strumming the bass strings, he sang:

> Powder in your pocket to poison me with,
> A locomotive in your pocket to crush me with.

Nikolai pulled back the draperies. The scales with the mercury heart had crashed to the floor. The tuning-fork generator lay in a pool of solution with sparkling drops of mercury in it. Valery sat on the table, his face as white as a sheet. He was holding up his right hand and was staring in horror at his extended little finger.

That evening Boris Privalov and Pavel Koltukhov remained at the Institute long after everyone else had left.

"If you don't mind my saying so, Boris, you're going round the bend about that idea of a pipeline without any pipes," said Koltukhov.

"Has Professor Bagbanly gone round the bend too?"

Koltukhov said nothing.

Privalov looked at his watch and stood up. "By the way, he should be here soon. Would you like to see what we're doing?"

They went down to the first floor and walked along a seemingly endless corridor. Privalov unlocked the doors of a room in which a stator from a big dynamo stood. Inside the stator, almost touching the pole shoes and windings, was a coil of glass tubing filled with a pink liquid. The ends of the coil were connected with a tank and a centrifugal pump.

"It looks like a high-frequency still for making home-brew liquor," Koltukhov said with a laugh, touching the cold glass with the tips of his fingers.

"We're doing two experiments with this apparatus," Privalov explained. "The liquid in the tube is water to which we have added acid to make it a conductor and a colouring substance to make it easier to observe. Now watch. This is the first experiment."

At the push of a button a faint hum arose as the centrifugal pump began to drive the pink liquid through the glass coil.

"The winding of the stator is not connected with the mains," said Privalov. "It's only connected with the voltmeter. Watch this!"

The voltmeter needle trembled and crept towards the right-hand side of the dial.

"See that?"

"Of course. The liquid is a conductor. It cuts the magnetic lines of force of the stator and induces electromotive force in the windings. There's nothing new about that. A meter in which a liquid passes through a tube of non-magnetic material is based on this principle."

"That's true, there's nothing new about it. But whereas the voltage in those meters is insignificant, here—"

"Oho!" exclaimed Koltukhov, his eyes on the voltmeter. "How did you manage that?"

"Professor Bagbanly," Privalov said shortly. "Now we'll do the experiment the other way round."

He switched off the pump. The liquid stopped moving and the voltmeter needle returned to "zero".

"Now I'll simply send some current into the stator winding."

He pushed another button. Although not driven by the pump, the pink liquid again ran up into the spiral.

"Let's make it harder." Privalov turned the knob of a valve. "Keep your eye on the pressure-gauge. I could increase the resistance still more and get a higher pressure. But the fragility of the glass tubes prevents me from doing so. Do you see what I'm getting at?"

Koltukhov looked puzzled. His eyes stared fixedly from beneath his grey eyebrows.

"Wait a minute," he said. "In other words, a liquid in an electromagnetic field starts moving all by itself. Is this a model of the movement of a liquid through a pipeless pipeline?"

"Right. The only difference is that the surface tension of the liquid will take the place of pipes, while a directed field will replace the windings and magnets."

"'The only difference' is a mild way of putting it," Koltukhov muttered.

They heard quick footsteps in the corridor. The door opened and Professor Bakhtiar Bagbanly entered.

"Ah, our main opponent!" he said as he shook hands with Pavel Koltukhov. "Have you come to see for yourself?"

"He's sceptical," said Privalov.

"Well, that's part of the scientific approach." Professor Bagbanly ran his eyes over the apparatus, then asked Privalov some technical questions about the experiment. He began to pace the room, a short, stocky, large-headed man with thick grey hair.

"What examples do we have of mutual penetrability?" he asked suddenly.

"Diffusion," said Privalov. "The diffusion of solids."

"Yes, but diffusion calls for specific conditions. Even if you press perfectly polished surfaces of lead and tin together very hard, it will take years before even the slightest penetration takes place. However, if you heat a compressed bundle of lead and tin to 100 degrees a layer of intermingled molecules will appear in their border area within twelve hours. What is it that puts up resistance to transition through the contact zone?" The Professor stopped his pacing and gave the two engineers a thoughtful look. "The surface! That mysterious world of two-dimensional phenomena."

He resumed his pacing, meanwhile smoothing with his fingertips, the grey moustaches beneath his hooked nose.

"There's another diffusional phenomenon," he went on, "and that is pressure contact welding. It produces mutual penetration, but you need high temperatures and pressures to do it."

"What about welding inside a vacuum?" Privalov asked. "It can be done at a very low pressure and without much heating. What is more, you can join the most diverse materials—steel and glass, for instance. Actually, it isn't so much welding as intensified diffusion."

Professor Bagbanly nodded in agreement. "Yes, but why? Possibly, because in a vacuum a surface is free and opens up, as it were, since it borders on empty space. The forces protecting the surface weaken and open up the substance. However, our goal is to intensify diffusion until we attain

a state of unhindered mutual penetration. Forcing matter to open its gates, isn't that so?" He traced a question mark in the air with his forefinger.

"Is there a lot of matter in solids? The answer is no, there's very little. Actually, an atom has a very insignificant volume. But what is the atom filled with? After all, matter is concentrated in the nucleus of the atom. From the standpoint of density, everything under the sun is as sparse as—" he searched for a comparison—" as sparse as the hair on the head of our friend Pavel Koltukhov."

Koltukhov gave a smirk and involuntarily ran a hand over his bald head.

"Considered from the position of a mechanical model, matter can easily be penetrated," Professor Bagbanly went on. "Actually, though, we cannot regard matter as a mechanical conglomeration of small spheres situated at a great distance from one another. Powerful internal forces connect all the components and prevent penetration. If those forces did not exist my hand would easily pass through metal." He laid the palm of his hand on the stator. "The probability of physical particles meeting is insignificant. Less probable than peas colliding if two handfuls are thrown towards each other."

The Professor wiped his hands on his handkerchief and looked at the two men, his former pupils, as though expecting them to make some objections.

"Now I'll formulate the problem," he said, in the same tone of voice he had once used when lecturing to his students. "Hang your ears on the hook of attention. Without changing the mechanical structure of matter we must re-arrange

its bonds—the bonds between atoms and between molecules—in such a manner that they will be completely neutral when they come into contact with ordinary matter during the period of reciprocal penetration. The internal bonds must be re-arranged! Then we'll achieve penetrability."

Koltukhov opened his mouth to make a caustic remark, but just then the telephone rang.

Privalov picked up the receiver. "Hullo. Yes, this is me. Is that you, Nikolai? Now take it easy—" He listened for a moment. "What?!" His face changed. "I'll be there in a jiffy." He put down the receiver and glanced at Professor Bagbanly. "We must all rush off at once!"

When the blue draperies were pulled across that section of the room Valery realized that an uninvited guest had dropped in. He put down the tuning-fork and, to keep himself busy, examined the connections. It was a good thing he did, for he discovered that one of the weights which regulated the frequency of the tuning-fork breaker was loosely attached, and that the scales on which the mercury heart stood had shifted slightly.

"From the vibration, no doubt," Valery said to himself. Carefully, with his little finger, he moved the scales inside the Möbius band while he adjusted the weight with his other hand. At the same moment guitar chords sounded on the other side of the blue draperies and Yura's voice burst into song.

"An old-fashioned tune," Valery reflected as he continued to move the scales with his finger. All of a sudden he felt a faint quiver in the little finger.

"An electric shock?" he wondered. "No, I haven't touched any metal."

To be on the safe side, he thrust his little finger into his mouth. How curious! The finger did not feel his mouth, and his mouth did not feel the finger. He stared fearfully at his finger. It looked perfectly normal. He put it into his mouth again. But again there was no sensation whatsoever. He tried biting the tip of the finger. His teeth came together as though there was nothing between them.

Remembering that there was a visitor in the house, Valery stifled a scream. "It took an iron will to keep from shouting," he later said. But his body gave a jerk that dislodged the mercury heart from the scales and overturned the tuning-fork breaker.

Professor Bagbanly, Boris Privalov and Pavel Koltukhov hurried up the stairs and burst breathlessly into Nikolai's flat.

"Where's Valery?" Privalov demanded.

Valery, his face pale and covered with sweat, came into the room. Nikolai excitedly told what had happened.

Professor Bagbanly touched Valery's little finger. The tip and the joint next to it were penetrable. The Professor's forefinger passed through them easily and touched his thumb.

"Feel anything?" he asked.

"No," Valery whispered.

It was easy to establish where the penetrability ended.

"Light a match," said Professor Bagbanly. "Calm down, young man," he added when he

saw Nikolai nervously break a couple of matches as he tried to light them. He turned to Valery. "I want you to put the tip of your finger into the flame of Nikolai's match."

Everyone held his breath. Valery looked as though he were walking in his sleep. He slowly put his little finger into the flame. It wavered but its shape did not change.

"Do you feel anything?"

"Yes," said Valery hoarsely, holding the tip of his finger in the flame. "My fingertip feels warm."

The engineers were dumbstruck. They stared in a daze at Valery's little finger.

"Thrust your finger into the table," the professor said.

Valery obeyed. Half of his finger went into the wood.

"Less goes in now," he said. "At first almost the whole finger went in."

Professor Bagbanly exchanged glances with Privalov. Then he set about examining the apparatus.

"A Möbius band?" he said. "Quite an idea. What did the instruments register when it happened?"

"We weren't thinking about penetrability," Yura explained. "We wanted to increase surface tension, using this mercury heart. Valery must have put his hands inside the Möbius band a dozen times without anything happening. But when he moved the weight—and I plucked the strings of my guitar at the same time—something clicked. Valery was so scared he overturned everything, and so we don't know the exact readings."

"Automation experts, humph!" Koltukhov

remarked, looking the silent, frightened young men up and down. "What's the idea of this clandestine laboratory? I shudder to think of the damage you might have done!"

"Have you tuned your guitar since then?" Privalov asked.

"No," said Yura.

"Then play exactly what you played then. We'll record it," said Professor Bagbanly. "You have a tape recorder here, don't you?"

Meanwhile, Valery's little finger was gradually returning to its normal state. He kept testing it against the table. Finally only the very tip of the finger went into the wood. Then, suddenly, he felt his fingertip being pinched, and with a cry he pulled his hand away, leaving a bit of skin in the wood. He immediately thrust his bleeding finger into his mouth. His face broke into a broad smile. "It's ended!" he shouted.

The courtyard in Cooper Lane throbbed with music. Strains of music, much of it in a plaintive Oriental key, poured forth through all the open windows from radios, record players and tape recorders.

Nikolai had never contributed much to the musical life of the courtyard, but now he aroused the hostility of all his neighbours. Evening after evening there came from his windows the same tiresome strumming of a guitar, accompanied by the thumping of a foot keeping time, and his friend Yura's voice singing:

> Powder in your pocket to poison me with,
> A locomotive in your pocket to crush me with.

A detailed description of the installation had been sent to the Academy of Sciences in Moscow, together with a long memorandum and the tapes. The young engineers had been ordered to keep their mouths shut and to stop experimenting at home.

"You've done enough mischief," said Koltukhov. "Probing the structure of matter is not as simple as strumming a guitar."

CHAPTER FIVE

IN WHICH BENEDICTOV WALKS OUT OF THE HOUSE

Rita returned home from school earlier than usual that day. She let herself in with her key, stepped into the entryway and took off her coat, then paused to listen. Rustling and creaking sounds came from the bedroom. The creaking was clearly the wardrobe door.

She knew that Anatole was never at home at this hour. Could a burglar have broken in?

Rita tiptoed to the bedroom door. She held her breath and listened. Yes, it was a burglar! What she had to do was lock the bedroom door and dash to the phone.

Just then she heard a familiar cough.

"How you frightened me!" she exclaimed, flinging open the bedroom door.

Anatole Benedictov, in his brown house jacket, was standing in front of the open wardrobe. He did not turn when Rita entered. Instead, he closed the wardrobe and limped to the window.

"What's the matter?" she asked in alarm. "Why are you home so early?"

"I feel a bit under the weather."

"Why are you limping?"

"Oh, it's nothing," Benedictov said reluctantly. "I was looking for a handkerchief. Could you get me one, please?"

Rita opened the wardrobe and took out a handkerchief.

"You don't look well, Anatole," she said. "Could you be running a fever?"

He waved aside the suggestion and went into his study. Rita changed into her house dress and went to the kitchen to prepare dinner.

Two days ago she had noticed that the articles in the drawers of her dressing table were disarranged. She had not attached any importance to it at the time, but now she realized that Anatole was probably searching for the knife. He did not believe her when she said the knife was at the bottom of the sea.

She sliced the potatoes in thick rings and put them into the sizzling frying pan. Anatole loved fried potatoes. He hardly talked to her at all any more, she thought sadly and anxiously. He had grown terribly excited when she told him about the two young men who had dropped in. "No one in his right mind would have thrown out that box containing Fedor Matveyev's manuscript!" he had shouted. But how could she have known that the rusty little bar propping up the old wardrobe would contain an eighteenth-century manuscript? Nor did she know anything about a third box the young men wanted to lay hands on.

After that unpleasant conversation Anatole had grown more sullen than ever. He no longer talked to her at all about his work.

Now Anatole was working on some project together with Opratin. Rita had long since lost hope that Anatole would achieve some measure of success. However, perhaps his collaboration with Opratin would prove fruitful. But what if they really couldn't get along without the knife?

Another source of doubt and anxiety was the young engineer who had rescued her at sea. Rita's thoughts kept returning to the two young men who had called on her. What did they want those small iron boxes for?

The name Nikolai Potapkin did not mean anything to Rita, yet there was something vaguely familiar about the young engineer's face and his way of carrying himself. She had been conscious of this when he and his friend came to inquire about the boxes. Now she was almost certain. Without knowing why, she refused to acknowledge it.

When Rita called out to her husband to say that dinner was ready he refused to come to the table. He lay on the couch in the study, his eyes feverish and his face flushed and drenched in sweat.

"You're ill!" Rita exclaimed. "I'll call the doctor."

"No doctors. Just get me some penicillin from the medicine chest."

Only late at night, when he was running a high fever, did he allow Rita to apply a cold compress to his leg. Then she accidentally discovered a big abscess on his right hip.

Nikolai Opratin dropped in the next evening. He sat beside Anatole for a while, discussing various matters. He was most polite to Rita.

He told her that the work was going along well, and praised Anatole's erudition.

The next morning the burly, plump-cheeked man brought round a packet of drugs for Anatole. "I was told to hand this over to him personally," he told Rita in a hoarse bass voice. But Anatole was asleep and she refused to wake him.

After she closed the door on her unpleasant visitor Rita opened the packet. It contained ampoules of a drug which Rita recognized to be a narcotic.

Suddenly the whole thing became clear to her. She sat beside her husband's sickbed for a long time in a daze. She did not cry. She felt as though she had shrivelled up inside.

When Anatole awoke she silently showed him the packet. He frowned and began to snuffle.

An unpleasant conversation followed.

"Yes, yes, I understand," said Rita, clasping her hands, which were now two lumps of ice. "You wanted to increase your working capacity and then gradually started taking bigger and bigger doses."

"Oh, leave me alone," he said wearily.

"Give it up, Anatole," Rita pleaded. "Stop taking the drug. That boil of yours comes from a dirty hypodermic syringe. You won't give yourself any more injections, will you? You'll drop the habit, and then everything will be fine again."

"That's enough!" Anatole shouted.

"I insist that you stop," Rita said resolutely. "I'll take you in hand if you lack the will-power to do it yourself. As for that fat-faced fellow, I'm going to have him arrested."

Benedictov raised himself on his elbow and swung his feet out over the side of the bed. Rita

rushed to prevent him from getting up. He pushed her aside. Without uttering a single word he put on his clothes and walked to the door, dishevelled, desperate-looking, and aloof. He slammed the door so hard that a shower of plaster came down from the ceiling.

Rita stood beside the door for a long time, the palms of her hands pressed to her cheeks. She did not cry. But something within her was broken.

Anatole did not return. Twenty-four hours later Vova Bugrov came to the door bearing a note in which Anatole asked for his things. Rita picked up the telephone.

"Not thinking of calling the law, were you?" Vova asked with a grin. "I wouldn't if I were you. I didn't get those ampoules for myself but for him, because he begged me to. If you report it you'll make things very hard for him."

Vova was right, Rita realized. She silently packed a suitcase of her husband's clothes. Vova went into the study and picked up several laboratory instruments. As he prepared to leave he mumbled that Benedictov was now staying with Nikolai Opratin.

When Anatole told Opratin that he had walked out of the house the latter frowned. Fate had sent him a restless man for a partner.

"Well, what's there to be said now?" he remarked. "You may stay at my place for the time being. There's plenty of room. For the sake of science I'm willing to put up with a lodger as bad-tempered as you are."

Anatole moved into the spare room in Opratin's bachelor establishment. There were Oriental rugs on the floor of the room and in two of the corners stood cabinets with porcelain figurines.

"Are you a collector?" Anatole asked with a condescending smile.

"Porcelain is a weakness of mine," Opratin said shortly. "How is your boil?"

"It's healing."

"Look here, Anatole," said Opratin. "We've got to speed up our experiments on the island. I've been told that Privalov and his assistants are working along the same lines as we are. They've set up some sort of installation and are getting promising results."

"How do you know all this?"

"It doesn't matter how I found out. From Vova Bugrov, if you want to know. They've got in touch with the Academy of Sciences through Professor Bagbanly. In other words, they are consulting with scientists in Moscow. How do you like that?"

Anatole did not like it at all. "I'm going out to the island tomorrow morning," he said, slapping the table with the palm of his hand. "I'll get things humming. Don't forget, though, that if we don't lay hands on that knife by the time we get the installation assembled we'll be on the rocks."

"You'll have the knife," Opratin said calmly. "And something else, besides—something that may be even more important. I'll make a trip to Moscow in January. With Bugrov."

"Who'll take me out to the island in the motorboat?"

"I'll get someone at the Institute to do that. Only don't let him anywhere near the laboratory. But you know that. We'll discuss the details when the time comes."

There she was, alone in the flat, a deserted wife. She looked up Opratin's number in the telephone directory. All she had to do was dial that number and she would hear Anatole's voice. All she had to do was say, "Come home, Anatole. Forgive me. I can't go on alone."

No, she couldn't say that. She hadn't done anything that called for forgiveness. He should be the one to beg forgiveness.

But she was plagued by the thought that she had failed him, not kept proper watch over him, not stopped him in time, and that therefore she was to blame.

A friend in Moscow wrote inviting her to come for a visit during the New Year school vacation. "A change will do you good. You can take in some of the new plays," the friend said. Rita wondered whether perhaps that might not be a good idea.

The ringing of the bell made her jump. She ran to open the door. Her heart was beating furiously.

Nikolai Opratin stood at the door. He greeted her courteously and smiled at her. Rita was unable to say a word. Her lips trembled.

Finally she pulled herself together and invited him to step in. She was determined not to give Opratin the slightest indication that she wanted to burst into tears.

What was he saying? "Anatole and I may soon have an important discovery to announce to the world. We would be able to do so even sooner if we had that knife of yours." He scrutinized her with cold, appraising eyes.

Rita said nothing.

"It is in your own interests too," he said. "Give us the knife".

"How can I!" she said in a steady voice. "You know as well as I do that the knife fell overboard."

"It didn't fall overboard," Opratin said quietly. "But if you find the subject distasteful let's drop it. However, its a pity, a great pity." He rose. "What shall I tell Anatole?"

"Give him my very best regards. Tell him I'm going to Moscow."

"To Moscow?"

"Yes, to visit a friend of mine during the winter school vacation."

"When will that be?"

"At the very beginning of January."

"What a remarkable coincidence," said Opratin, smiling with his lips only. "I'll be going to Moscow on business early in January. I hope to have the pleasure of seeing you there."

CHAPTER SIX

IN WHICH BORIS PRIVALOV AND NIKOLAI POTAPKIN VISIT THE INSTITUTE OF SURFACES AND NIKOLAI GETS A BRAINWAVE

The blue bus with the transparent roof rolled along the snow-covered highway, past birch groves and white-mantled farm fields. It went through a small town, rumbled over a bridge across a frozen stream and dived into the dark tunnel of a fir forest.

Nikolai kept his eyes glued to the bus window, gazing with interest at the unfamiliar landscape. He had come to Moscow with Boris Privalov two days before on matters connected with the transcaspian oil pipeline project. They had spent all of the previous day at the Ministry, talking with engineers and officials. Now they were on their

way to the Institute of Surfaces, one of the newest research facilities of the Academy of Sciences.

When they turned off into a driveway the pale winter sun splashed its rays through the windows, and it immediately grew cosier inside the bus.

Privalov folded his newspaper. "We've arrived," he said.

They stepped out of the bus into a frosty blue midday silence and the fragrance of a fir grove. The frost pinched their nostrils. The snow crunched underfoot.

They crossed a large cleared area on which the Institute housing estate had been built, then walked through another grove and came to a broad avenue of Institute laboratories and other buildings.

A path in the deep snow brought them to a two-storey building. Inside, they walked down a green-carpeted corridor, passing a series of doors with numbers on them. They stopped in front of a thickly padded door with a lighted sign above it that said "Quiet, please". From the other side of the door came the sound of a man's voice singing to the accompaniment of a guitar. This seemed as incongruous in the businesslike Institute atmosphere as the mooing of a cow in a symphony orchestra.

To the strumming of the guitar, with a foot energetically beating out the time, a youthful voice sang:

> Powder in your pocket to poison me with,
> A locomotive in your pocket to crush me with.

Nikolai and Privalov exchanged glances. They had recognized Yura's voice. This was their tape recording of the experiment.

Members of the Institute staff were expecting Privalov and Nikolai. The visitors were led into a large, windowless room whose walls were covered with consoles and control panels. Daylight streamed in through a broad oval skylight.

A lean man in a dark suit, with high cheekbones, a hooked nose and neatly parted hair rose from his desk to greet the visiting research engineers. Nikolai cautiously pressed the hand that was held out to him and stuttered as he gave his name. He was awed at meeting Academician Georgi Markov a world-famous scientist.

"Please be seated," Academician Markov said, indicating armchairs with a brief wave of his hand. "I'm glad to see you. In a few moments two of my assistants will drop in and tell you what we are doing with your music."

Nikolai felt like sinking through the floor. How tired he was of Yura's pranks! There were hundreds of pleasant songs, yet Yura had chosen to sing one of the silliest ditties in the world. But what did it matter to Yura? He did not have to sit here and watch the polite smile on the face of the country's most distinguished physicist.

"I can tell you that if it were not for Professor Bagbanly's confirmation that he had seen it with his own eyes we never would have believed it." Academician Markov looked at Nikolai. "You're the one who designed the installation, aren't you?"

"Actually, all I did was think of how to make use of the Möbius band."

"How did you get the idea?"

"Fedor Matveyev's manuscript prompted it. If you remember, he described some sort of a coil."

"That's right. A half-twist spiral. It interested

us too. Allow me to congratulate you. It was an excellent idea."

Nikolai felt flattered. Before he was aware of it he was grinning from ear to ear. Wiping off the grin, he said hurriedly: "Automation experts helped us to design the installation on the basis of ideas suggested by my colleague Yura Kostyukov. He's the man whose voice you hear singing that unpardonably silly song which, of course—"

"Think nothing of it," said Academician Markov with a friendly smile. "At your age I liked that song too."

A stocky young man, not much older than Nikolai, wearing a sports jacket, and a rosy-cheeked girl in a grey suit entered the room.

The Academician asked Nikolai to describe the experiment he and Yura had carried out in Cooper Lane. All listened to Nikolai's account in attentive silence.

"We weren't interested in penetrability at all," Nikolai remarked in conclusion. "All we wanted to do was build up the surface tension of mercury."

"You've made the picture clearer," said Academician Markov. "Now we'll hear what Vassily Fedorovich has to say."

The stocky young man in the sports jacket began by laying several diagrams and photographs on the table. Then he launched in to a description of the installation he and his fellow-workers had built. Basically, it was a duplicate of the one in Cooper Lane, but with precise recording apparatus and a more efficient mechanism in place of the tuning-fork breaker.

Privalov and Nikolai were then invited to examine the installation. Yes, this isn't Cooper Lane,

Nikolai mused as he looked at the apparatus and instruments. Actually, though, there wasn't any real difference. Here, as at home, the Möbius band was the dominant element.

Two rods pressed together by powerful electromagnets had been set up inside the band, and under the right conditions they were to penetrate each other. But the right conditions had not yet been attained. The dials of the instruments registered zero.

A tape recorder inside a soundproof room was playing back Yura's rendition of that ill-fated song. The sound was converted into electromagnetic oscillations that were recorded on tape for feeding into a computer.

The Institute computer knew all the parameters of the set-up. All, that is, except the crucial one. If Valery had not shifted the tuning-fork breaker the weights would have remained in the same accidental position in which penetrability had taken place. Now the installation had to be operated to the accompaniment of all the frequencies that occurred in Yura's song. The computer kept formulating and solving a series of equations. The solutions were communicated to the installation in the form of electrical commands.

"I wonder," said Boris Privalov, turning to Academician Markov, "if you could tell us what you think of penetrability and its causes."

"It is really too early to say anything definite. However, it seems to me that our friend Professor Bagbanly is fundamentally right. It is all a matter of a reorganization of the internal bonds of matter. Something special takes place in the Möbius band, with its one-sided surface. At a definite frequency, of course."

Then, with the words "Let us proceed further," he led his visitors out into a wide corridor. "A Möbius band in a high-frequency circuit is certainly a most fortunate conjecture. It holds out great prospects, prospects which perhaps you do not even suspect. But since we have a definite goal in front of us—an underwater oil pipeline—we decided that in the first stage we would apply our energies to this particular problem. Actually, we face two problems. First, we need greater surface tension to shape a stream of oil as desired. Second, we need penetrability in order to reduce to a minimum, or else eliminate altogether, resistance to the movement of the stream. Do you agree?"

"Yes, you're quite right," said Privalov.

"The second problem is still a matter of the future, but the first one—well, take a look for yourselves."

He flung open a door.

A round concrete pool three and a half metres in diameter filled the middle of the room. A large horizontal metal band attached to corrugated insulators encircled it.

"A Möbius band?" Nikolai asked hesitantly, examining it. "It's a giant!"

They followed their host up to a platform, from which they saw that the pool was half full of a viscous black liquid having a greenish tinge.

"That's petroleum," said Academician Markov. "Ten tons of it. Now watch."

He pressed a button on a panel.

The surface of the oil welled up in the middle and continued to expand. The edges began to draw away from the sides of the pool, exposing its bottom. The process went ahead faster and

faster. Some powerful force was shaping the black liquid into an almost perfect sphere three metres in diameter. Its surface grew shiny and iridescent. The figures standing on the platform were reflected in it crookedly, as though in a distorting mirror.

"Oho!" Privalov exclaimed.

Nikolai gazed with glowing eyes at the black sphere lying in the pool. His mind went back to the pulsating drop of mercury on Cooper Lane. But only for a moment. Everything was swept away by the enormous black sphere. So this was surface tension!

"The f-frequency—W-what's the f-frequency?" Nikolai asked, stuttering in excitement.

"We'll give you all the details. But this force isn't strong enough to take the place of the pipe wall made of steel."

The Academician switched off the current and the sphere immediately collapsed, flowing back to fill the pool again. The oily black surface heaved deeply and then became motionless.

"I think the Möbius band can give us a much greater degree of intensification," said the scientist. "An interesting feature is the reversible process, a law of physics. Within a very narrow range of operational factors—which we still don't know completely—the set-up produced a weakening of the bonds of matter. Strictly speaking, that business with the finger in your laboratory, the penetrability, is a spin-off. Incidentally, do you people realize what this amazing discovery means?"

Nikolai said nothing. He had long ago taken a pledge not to build castles in the air. He would keep strictly to the oil pipeline.

"Not altogether, naturally," said Privalov.

"But we think there'll be a revolution in the cold working of metals—cutting without resistance and the like."

Academician Markov nodded.

"Furthermore, penetrating tools will be used to sink coal mines and drill oil wells," Privalov went on, his voice eager. "I even think—you mustn't laugh, though—there might be a way of protecting spaceships against meteorites."

"It's within the realm of possibility," the Academician said thoughtfully. "But it won't be at all easy to work out the specific approach required in each practical application. The surface of matter possesses energy, and it looks as though we may lay our hands on it."

Privalov ran his fingers through his thick hair. "A new type of energy?"

"No, a new source of energy," Academician Markov said. "A more available source than nuclear energy."

All were silent for a moment.

"If only we could actually look at and feel a specimen of restructured matter," the Academician went on. "Who can tell when our set-up yields the first matter of this type? What a pity the effect produced on the finger of your lab technician was so short-lived. Now if we could by some miracle acquire Fedor Matveyev's knife—if such a knife actually exists, of course."

"What if the knife is just lying about somewhere at this very minute?" The stocky young man in the sports jacket put in. "Fedor Matveyev did bring it to Russia, didn't he?"

The words "lying about somewhere" conjured up in Nikolai's mind a picture of a summer day flooded with hot sunshine, the boat races, Opra-

tin's motorboat and Vova Bugrov in the water beside it. When Nikolai swam up to the boat he heard Bugrov say "All I want is the knife." Vova had an aqualung. There was some kind of a scanning device in the motorboat. They were searching the sea bottom at the spot where Rita had fallen overboard.

Before that, Opratin had come to their Institute and had questioned them to learn just where she had fallen into the sea. Come to think of it, he had asked—yes, he had—whether the woman had had anything metallic in her hand. It was the knife, Fedor Matveyev's knife, that Opratin and Bugrov were looking for.

If the little iron box containing Matveyev's manuscript had been taken for a piece of ordinary junk and had been thrown out of Rita's house—and Nikolai did not doubt that it had—it was possible she could have possessed Matveyev's knife. It could have been in another box.

Nikolai recalled the sketches on the last page of the manuscript. The box in which they had found the manuscript was named "The Source". There was a sketch of another box, called "The Evidence". Evidence! What could be better evidence than that knife?

Nikolai had finally woven all those scattered impressions into a single picture. Fedor Matveyev's knife did exist. Rita knew about it. Opratin and Bugrov were searching for it. Or perhaps had already found it.

Although Nikolai was eager to pour out the whole story he held his tongue. This was neither the time nor the place. He brought his mind back to what the others were saying.

"If Fedor Matveyev held the knife by the handle

it means the handle was made of ordinary material," the scientist stated. "There must have been a transition zone in the blade.

"Should I send a wire to Yura?" Nikolai wondered. "Maybe he could pry some information out of Bugrov or Bugrov's wife. We must lay hands on the knife. We simply must."

Again he brought his mind back to the conversation.

"The bonds in matter are not stable. They are constantly changing—"

"Why didn't Yura and I think of it before?" Nikolai asked himself. "It dawned on me only just now, when he said the knife might be lying about somewhere."

"We may need some practical assistance from your Institute," Academician Markov was saying. "How would your director look upon that?"

"I don't know", Privalov confessed. "The pipeline across the Caspian which we are designing is to consist of ordinary steel pipes. It's a definite project, with a definite deadline, and we have to concentrate our energies on it. The idea of a pipeline without pipes—well, that's merely a vague conjecture so far."

"We'll arrange for permission from the Ministry, or rather, this girl here will do it. She's a representative from the Ministry. She's so pretty you might take her for an empty-headed little creature, but I can assure you that she knows every nook, corner and path in the bureaucratic jungle."

"What a thing to say about me!" the girl protested, laughing.

Soon after, the two visitors made their farewells. Privalov settled his tall caracul hat firmly on his head with a sigh, took Nikolai by the arm, and they left the Institute of Surfaces.

The moment the men returned to Moscow Nikolai sent off a wire to Yura.

Am certain O. and B. are seeking Fedor's knife. Investigate immediately. Contact Bugrov's wife.

CHAPTER SEVEN

IN WHICH "THE KEY TO THE MYSTERY" DISAPPEARS AND FEDOR MATVEYEV'S KNIFE REAPPEARS

Nikolai was flabbergasted by what he had seen and heard at the Institute of Surfaces. The magnificent prospects which Academician Markov had hinted at in passing were hard to take in all at once. They had to be assimilated gradually.

He and Privalov spent several evenings in their hotel room talking about those prospects.

As they were drinking tea in their room one morning there was a knock on the door.

"Some letters for you," said the floor clerk. There were two letters, one from Privalov's wife, the other for Nikolai from Yura. Nikolai slit open the envelope and ran his eyes over the first few lines of Yura's letter. He could not help laughing aloud. Yura was his usual self.

The letter began as follows:

"The Right Honorable Nicholas S. Potapkin, Esq.

"Dear Sir,

"First of all, allow me to inform you that when the mail coach at last drew up to our gates, instead of the longawaited detailed letter all I found in the pouch was a short and meager message. Damn it all, sir. I am a plain man, sir, and I want to state in plain language that I looked upon you

as a gentleman. Nevertheless, I am writing to you, although I would perhaps do better to exchange my pen for a pistol, which is the best thing to use against damned coyotes like yourself. After reading your dispatch I jumped into the saddle and galloped off like the wind. I hitched my mustang to a chaparral bush, then strode through the gateway of your ranch—"

At this juncture Yura's patience with Wild West lingo ran out and he continued more simply.

"I waited a long time under the archway before Bugrov's wife came out of the house and into the yard. Then I bumped into her, quite by chance, of course, and gallantly bowed and scraped before her. I gave free rein to my tongue as I brought her around to answering my main question: was it true that Uncle Vova, using our scuba diving gear, had found an object which had fallen into the sea from the deck of the *Uzbekistan*? 'How come you know about that?' she asked, looking at me with suspicion. 'Were you on board the ship too?' 'No,' I answered, 'but I was on board the sailboat that picked up the lady in red.' At this she took me aside and told me the whole story."

Here Yura described in detail what had taken place on the deck of the *Uzbekistan*.

When he finished reading this part of the letter Nikolai sprang to his feet.

Privalov raised his head. "What's the matter?"

"Read this, Boris. Starting from here."

Privalov quickly scanned the page.

"Oho!" he exclaimed. "So Matveyev's knife really does exist! What happened next?"

Next, Yura reported that Bugrov had left for Moscow together with Opratin. Yura related how,

after his talk with Claudia, he had gone upstairs to see Nikolai's mother. Nikolai had authorized him to collect his pay envelope and pass it on to her. While he and Nikolai's mother were chatting about the cold weather in Moscow and wondering whether Nikolai wasn't too lightly dressed for those severe frosts, there was a knock on the door. Yura went to open it. A thick-set, unshaven, shaggy-haired, middle-aged man stood there.

"I would like to see Nikolai Potapkin," he said.

"That's me," Yura said, making a sign behind his back to Nikolai's mother.

"I'm Anatole Benedictov," the visitor said.

"Pleased to meet you. Won't you take off your coat and sit down?"

Benedictov refused to take off his coat, but he sat down at the table and put his hat and gloves in his lap.

"This is a return visit," he said. "I'll get right down to the point. My wife told me you were interested in some small iron boxes. Could you tell me what it's all about?"

"You know the answer to that question better than I do," Yura replied. "A little iron box that was thrown out of your house as a piece of junk was found to contain a manuscript. We became interested in the manuscript and began to search for the two other little boxes mentioned in it. One of the boxes evidently contained Fedor Matveyev's knife. It's a great pity the knife is lying at the bottom of the sea. Or have you found it by now?"

Benedictov's hands twitched nervously.

"Very well," he said, coughing to clear his throat. "Since you are so thoroughly informed, could you tell me what's inside the third box?"

"I wish I knew."

Both were silent for a while. Then Benedictov said: "As far as I know, you are working on the problem of penetrability. We're doing something along those lines too. I've heard that you put together an original apparatus and obtained interesting results. If it isn't a secret, could you—" He paused and looked expectantly at Yura.

"It isn't a secret, of course," Yura said slowly, choosing his words. We're designing an oil pipeline and while we were at it we became interested in the diffusion of liquids. As for our experiments, I'm afraid I cannot give you any details. I'm not authorized to do so. Why don't you approach the director of our Institute through the regular channels?"

"Through the regular channels, you say?" Benedictov gave a wry grin. "Thanks for the advise. It was a pleasure to meet you."

With those words Benedictov clapped his hat on his shaggy head.

"The feeling is mutual," Yura replied courteously. He picked up Benedictov's gloves, which had fallen to the floor, and handed them to him. "These are yours, I think. Did you get my address from the telephone book?" he asked casually.

"No, from a member of our staff who lives in this house."

"Ah, yes, of course. By the way, it would be very interesting to have a look at Fedor Matveyev's knife. If it isn't a secret."

"You yourself said it's at the bottom of the sea," Benedictov muttered.

On his way to the door, accompanied by Yura, Benedictov paused for a second to look at the blue draperies.

"Yes, you're right," Yura said in reply to Benedictov's unspoken question. "This is where the experiment took place."

He pulled aside the draperies with a broad gesture. Benedictov involuntarily stepped forward, but all he saw was a tape recorder of unusual design and, under the table, several black boxes containing storage batteries.

"We dismantled our set-up," Yura explained. "But you know what? If you're doing work along the same lines, then why don't we co-operate? Why not drop in at our Institute?"

Benedictov looked at Yura from under his heavy, swollen eyelids but did not reply. He simply said goodbye and went out in a slow, shuffling gait. Yura stood at the window watching him depart.

"Very curious news," Privalov remarked, pouring himself another cup of tea.

"I had a feeling from the beginning that she hadn't simply fallen overboard." Nikolai crumpled Yura's letter in his fist and began to pace the floor. "She went over the rail because she was diving for the knife. That's obvious. If she had found it she would have given it to her husband, of course. But her husband is collaborating with Opratin, and he—Opratin, that is—was searching for the knife at the spot where it fell into the sea. We can assume that Rita didn't find the knife, and it is still lying at the bottom of the sea, or else—"

"Or else what?" Privalov asked.

"Or else Opratin has found it."

"In that case we must speak to Opratin and ask him to lend us the knife for a time so that we can study it," Privalov said quietly. "It would help

us enormously." He sipped his tea. "If Opratin is in Moscow we'll get in touch with him. Sit down at the telephone and ring up the hotels. Start with the Golden Wheat and the Yaroslavl."

With so many hotels the job of locating Opratin by telephone seemed hopeless. Time and again Nikolai heard the words: "No one of that name registered here", or else the clerk did not bother to listen to the question but merely said, "Sorry, but we're full up." Finally, however, a voice said, "Opratin? Just a moment. What's his first name? Yes, he's staying here. Opratin and Bugrov. Room 130."

Nikolai laughed. "This is really one for the book. He's in a hotel across the street from us." Nikolai dialled the number of Opratin's room but no one answered.

"We'll try again in the evening," said Privalov. "I have to attend a conference of oil industry construction experts. Meanwhile I want you to straighten out a few questions at the Ministry."

Nikolai sighed. He did not like the Ministry. The endless corridors there always had a depressing effect on him.

"Oh, yes, I almost forgot," said Privalov. "Get yourself a ticket for Wednesday. I'll stay on a while longer."

When Boris Privalov entered the lobby of the underground his glasses became clouded over from the warm air inside. He took them off to wipe them, and when he put them on again the first person he saw was Nikolai Opratin, who had just stepped off the escalator.

Opratin wore an elegant coat with a fur collar

and a hat of young reindeer skin. He hurried up and greeted Privalov with what struck him as exaggerated affability.

"How pleasant to run into someone from home in the hustle and bustle of Moscow!" he exclaimed, pumping Privalov's hand. "I'm really very glad to see you."

"Why all this effusion?" Privalov wondered. "He's usually so restrained. But, after all, it is indeed nice to meet someone from home."

After the exchange of small talk customary on such an occasion, Opratin asked, in a casual tone, "What are they saying in the Academy about Fedor Matveyev's manuscript?"

"They're still studying it. Incidentally, there is a supposition that something else besides the manuscript has come down to our day."

"Really?" Opratin said, his voice now wary. "What's that?"

"Fedor Matveyev's knife."

"You don't put any stock in those Indian fairy tales, do you?"

Privalov did not like this. Why the subterfuge? He decided to take the bull by the horns.

"But we know that one of the members of your staff, Benedictov, had Fedor Matveyev's knife. We also know that you searched for it on the sea floor at the spot where the woman fell overboard from the *Uzbekistan*. If you found the knife, the Academy people would be interested in hearing a report on it. You realize how important it would be for the advancement of science—"

"You were misinformed," Opratin said in an icy tone. "I know nothing whatsoever about the knife."

"But you were searching—"

"My 'searching', as you put it, was connected exclusively with the problem of raising the level of the Caspian. As regards Benedictov, he is working on a research project at our Institute, and I haven't the faintest idea of what he does in his spare time."

This was a polite but firm rebuke. Privalov felt awkward. Indeed, what grounds did he have for broaching this subject? Yura's letter? A remark made by the talkative wife of a man called 'Uncle Vova'?

"I beg your pardon," he said. "It seems I was indeed misinformed."

"Yes, you were." Opratin glanced at his watch. "I must leave you now. I have an appointment." He gave a thin smile and set off briskly towards the exit.

Privalov followed him with a puzzled glance. If he only knew that at this very moment Opratin, his hand in his pocket, was fingering the handle of Fedor Matveyev's knife!

After several wearisome hours at the Ministry Nikolai went to Kursk Station for a ticket.

There were queues at the booking office. Nikolai shook the snow off his cap and took his place at the end of one of them.

"Who's last in the queue?" he asked.

A thickset man in a brown leather coat lifted his eyes from his newspaper to glance at Nikolai disapprovingly.

"I'm next to the last," he said. "There's a lady behind me." He looked round. "There she is, over there. You'll be after her."

Nikolai glanced fleetingly at the young woman

in a black fur coat and white fur hat. She was at a newsstand with her back to him.

The leather coat sniffed to clear his clogged nose and absorbed himself in his newspaper. Bored, Nikolai took advantage of his superior height to read the headlines over the man's shoulder. His eye was caught by a news item about an exhibition of captured equipment used by spies and subversive agents. The item described some of the displays: the wreckage of a foreign reconnaissance plane brought down by Soviet airmen; pistols fitted with silencers; walkie-talkies. There was also the equipment carried by an Italian subversive agent who died in a Caspian port in 1942. His remains had been accidentally discovered in an underground passage not long ago. The agent had apparently belonged to the Society of Jesus, for around his neck he wore a small flat box on which was engraved *A M D G.*

What was this? Nikolai leaned forward and fixed his eyes on the printed lines.

A M D G. The initial letters of the Jesuit motto.

The leather coat said irritably: "I intensely dislike having someone breathing down my neck, young man."

"I beg your pardon," Nikolai muttered in confusion. He hurried over to the newsstand and bought a paper, which he began to read at once.

All of a sudden he felt someone staring fixedly at him. He glanced in annoyance at the lady in black standing beside him, and then flung his head back as though he had been hit on the jaw. The lady was Rita.

"Are—are you in Moscow?" he stammered.

"It's obvious I am, isn't it?"

"Yes. So am I. I'm on a business trip." Nikolai coughed and started folding his paper.

"Are you returning home soon?"

"Yes, I'm getting a ticket for Wednesday. What about you?"

"I'm leaving tomorrow."

Nikolai thrust his paper into his pocket. Rita turned to the woman behind the counter of the newsstand. "I'll take these picture postcards," she said.

She chose half a dozen cards with colour reproductions on them. Nikolai glanced absently at them. One was a winter landscape, another Levitan's "March", then a picture in the Bilibin style, of a ship with a taut, wind-filled sail, bearing a drawing of the sun, approaching a landing stage where bearded men in long robes stood beside cannon wreathed in clouds of smoke.

Nikolai said the first thing that came into his head. "'Guns firing from the wharf, ordering the ship to tie up.' I used to copy that picture when I was a child."

Rita swung round to face him. "Did you ever give that drawing to anyone?"

Nikolai caught his breath. He stared intently into that pleasant, mobile, questioning face and suddenly saw long familiar features—a perky freckled nose, a mischievous smile, and glossy yellow braids jutting out at a belligerent angle

"Yellow Lynx?" he whispered.

What had Rita been doing in Moscow?

Her friend met her at the railway station on arrival and took her home. That same day Rita went to a hospital in Pirogov Street and made an

appointment to see a famous neuropathologist. He listened attentively to her story.

"Only a special course of treatment can help your husband," he told her. "The cure takes time and patience—but it is the only way. You must persuade your husband to undergo this course of treatment. I can arrange for him to enter the hospital where a pupil of mine, Dr. Khalilov, is doing very good work in this field. The sooner he does this, the better it will be for him. I'll give you a letter to Dr. Khalilov."

Now Rita was more upset than ever. She was determined to leave for home at once, before the end of the winter school vacation. However, her friend persuaded her to spend at least a week in Moscow.

During that week Opratin came to see her three times.

It so happened that Rita and Opratin had travelled to Moscow on the same train. They had discovered this when the train halted at Mineralniye Vody and both had stepped out onto the platform for a breath of fresh air. At Kharkov, Opratin had again approached her on the platform and chatted with her for a few minutes. Rita had given him her friend's telephone number, at which she could be reached in Moscow.

There was something threatening and alarming about Opratin's visits to Rita in Moscow. His presence made her uncomfortable; she felt as though the shadow of her husband were standing behind him.

Opratin talked to her in a gentle, friendly tone. He agreed with the doctor, he said, that Anatole should undergo treatment. He himself would help to arrange a leave of any duration for Ana-

tole. Rita was not to worry; there were no particularly alarming symptoms as yet. Anatole was cheerful and enthusiastic about his work.

"That backbreaking, endless, senseless work of Anatole's is what has estranged him from me," Rita thought.

"We're on the right track now," said Opratin. "But I want you to bear in mind that it depends to a great extent on you how much longer the job will take."

Opratin came to see her for the third time on a cold, snowy morning. It was warm inside the flat, but tense, disturbing music poured from the radio.

"That's a waltz from *Masquerade*," Rita remarked in a low voice to Opratin, who was seated on the sofa, his legs crossed, tapping one foot in time to the music.

"Look here, Rita," he said as the violins soared and then fell silent. "I know I'm making a nuisance of myself but I really must speak to you again about Fedor Matveyev's knife."

"This is becoming intolerable," Rita said coldly. "I've told you twenty times that the knife fell into the sea and was lost."

"No, the knife is in your possession," Opratin declared. "I can't understand why you are being so stubborn. Now follow me carefully. Anatole and I have invented a remarkable machine. If we exclude that accidental phenomenon which your ancestor Fedor Matveyev witnessed in India, no one has ever come so close to solving the problem of the mutual penetrability of matter as we have. This will be a major breakthrough. Your husband's name will stand side by side with those of the most brilliant scientists of our age."

"But I don't want that!" Rita burst out.

She turned away, biting her lip to keep from crying, and walked to the farther end of the room.

"He doesn't need fame," she continued in a calmer voice. "He needs to forget about that damned knife, cure himself and return home. That's all I want. That and nothing more. Please leave me alone."

Opratin rose. "Very well. I'll leave you alone. But Anatole will never return to you. Well, goodbye."

He moved to the door.

"Wait!" Rita shrieked. "Why—why won't he return?"

Opratin turned round abruptly. "Because he is slowly but surely killing himself. Because the doses he is now taking would kill an elephant. Because he will not be able to endure it if we don't succeed. And success depends only on the knife. The knife guarantees solution of the problem and, at the same time, your husband's recovery."

Rita pressed the palms of her hands to her temples. Her eyes were those of a sick, hunted animal.

Opratin waited. The wind whipped flurries of snow against the windows, making the panes tremble.

Rita walked with wooden steps into the next room. Opratin heard the click of a lock.

She returned and flung a knife on the table.

It fell with a strangely light tap.

Opratin walked unhurriedly over to the table. He picked up the knife by the handle and fixed his eyes on the narrow blade with the wavy design. Suddenly he plunged it into the table. The blade

entered the thick, polished wood almost up to the hilt. Opratin's eyes blazed with triumph.

"Rita, allow me to—"

"Don't. Just go."

She stood by the window for a long time, looking out from the ninth floor at a Moscow wrapped in clouds of snow.

Then she threw on her coat, dashed out of the flat, and took a taxi to the railway station.

"Yes, Yellow Lynx. That was what they called me when we were kids." She took Nikolai by the arm. Her eyes shone as though a film had been stripped from them. "I still have that drawing you made."

"I kept thinking there was something familiar about your face," said Nikolai in a constrained whisper.

"I kept wondering too. When you and your friend came to my house I was on the verge of recognizing you."

"You know who my friend was? It was Yura."

"Yura?" Rita laughed. "Dear me, he used to be such a little boy. But so brave, with those feathers stuck in his hair."

"But we told you our names. Didn't you—"

"Do you know my last name?"

"No."

"Well, I didn't know yours either. Children are never interested in last names. If we'd attended the same school it would have been a different matter."

Nikolai studied Rita's face. "Can it really be Yellow Lynx?" he thought in amazement. "You've changed a lot," he said.

Rita's face grew sober. She gave him a long, inquiring glance. Nikolai had the feeling that she was about to tell him something important. But she only said. "Do you still live in the same place?".

"Yes, in Cooper Lane."

"Cooper Lane," Rita mused. "It seems like a hundred years ago."

"Why not take a ticket for Wednesday?" Nikolai suggested hesitatingly. "Then we could travel together."

Rita was silent. Did she want to spend another whole day in Moscow? No, definitely not. She wanted lo leave tomorrow. There was nothing more for her to do in Moscow. But she suddenly heard herself saying, "Yes, Wednesday would suit me fine."

Afterwards they walked along the Sadovoye Ring. Rita, her gloved hand raised to protect her face from the snow, told Nikolai how her family had moved to Leningrad and then the war had come and her father had been killed when Tallinn was evacuated. He had been in command of a big troop transport. She and her mother had survived the siege of Leningrad. After the war they had moved back to the town on the Caspian Sea because her mother was very ill and the doctors had ordered a warmer climate for her.

Rita said nothing about her marriage.

"Why didn't you ever pay a visit to Cooper Lane?"

"I did, soon after we came back. I stopped in to look at the flat where we used to live. I saw a fat woman sitting on the balcony, knitting. The place called up painful memories. Everything reminded me of Father. If only Father had li-

ved—" Rita stopped. "Everything would have turned out differently."

She shivered. Nikolai screwed up his courage and took her by the arm.

"I remember now," he said. "There used to be two small bars of iron, with some kind of mysterious letters engraved on them, on your father's desk. Lately I've been wondering where I saw them before. Do you remember? We pledged to do everything we could to discover their secret."

"Do you know that my maiden name was Matveyev?" Rita suddenly asked.

"Matveyev?" Nikolai repeated in confusion. "That means you're—"

"That's right, I'm—" Rita's face grew longer. "But we won't talk about that now. Please don't. There's been too much for one day."

She gave Nikolai a searching look, studying his frank face and attentive grey eyes. His ears were a bright red. Imagine going about in such a frost with just a spring hat on one's head!

"I'm so glad I met you," she said in a low voice. "I have such a lot to tell you. No, not now. On the train."

It was nearly five o'clock by the time Nikolai returned to the hotel.

"Boris, you simply won't believe your eyes!" he called out exuberantly from the doorway. "Read this." He drew the newspaper from his pocket.

Privalov pushed his spectacles up to his forehead and skimmed through the item about the displays at the exhibition.

"A small metal box with the inscription

A M D G." Privalov leaned back in his chair and his glasses dropped onto his nose of themselves. "You think this has some relation to—"

"Yes, definitely. It's the same engraving as on our box. What if this is 'The Key to the Mystery'?"

"In the hands of an Italian subversive agent? Hm-m. Sounds doubtful to me."

"De Maistre came from Italy too," Nikolai protested. "And there are Jesuits there to this day, of course. We ought to go to the museum and take a look, Boris. If the size of the box coincides with the measurements in the drawing—"

There were not too many visitors at the exhibition. Several youngsters were arguing heatedly in front of the walkie-talkie display. Two airmen were examining the wreckage of a foreign plane brought down on Soviet territory.

It did not take Privalov and Nikolai long to find, in the next room, a tall glass showcase in which stood a life-size dummy dressed in a tattered outfit, with a parachute on its back. A small golden crucifix gleamed at the throat, visible through the open collar. Bars of blasting charges, an aqualung, a frogman's suit, a pistol, a radio transmitter and receiver, a ball of nylon cord and other articles were laid out at the dummy's feet.

But there was no sign of a small metal box with the inscription *A M D G.*

"How odd!" Nikolai slowly ran his eyes again over the things in the showcase. "Very odd indeed. The paper clearly stated—"

"Let's speak to the person in charge," said Privalov.

"Bugrov?" The clerk looked into the register. "He checked out this afternoon. Opratin and Bugrov. They called a taxi and drove off to the airport."

CHAPTER EIGHT

IN WHICH ADDITIONAL INFORMATION ABOUT THE MATVEYEV FAMILY IS BROUGHT TO THE READER'S ATTENTION

"Get in quick!" the plump conductress said to Nikolai.

Nikolai waved to Privalov for the last time and hurriedly followed Rita up the steps and into the carriage.

The early winter twilight thickened fast. The houses of a small town appeared in sight and vanished, to be followed by a frozen stream and three motionless figures standing with fishing lines beside holes in the ice.

Nikolai was the first to speak. "There's something you wanted to tell me, Rita, isn't there?"

"Yes, there is."

The wheels clicked rhythmically on the rail joints.

Nikolai stared out into the darkness with unseeing eyes as he waited for Rita to begin.

"I did know how to start," Rita finally said. "It's all so complicated—and I've never told anyone about it before." She sighed softly. "All right, listen. You remember those two small bars of iron that used to lie on Father's desk when we were children, don't you? I'll tell you everything I know about them."

The authors will now take the liberty of rela-

ting the story of the boxes since they have every reason to believe that they now know it better than Rita did.

The Story of the Three Boxes

Stories about strange doings in the Matveyev family had long been circulating in St. Petersburg. To begin with, way back during the reign of Peter the Great a Matveyev, a naval lieutenant, had returned from India with a bewitchingly beautiful dark-eyed girl. The "taint" in the Matveyev family had probably started with her. Her sons and grandsons did not rise high in the government service. They cut short their careers by resigning and burying themselves on their estate in the Tver Province. There they lived in seclusion, rarely entertaining any visitors.

From the few outsiders who did enter the house it was learned that rustling, grinding and crackling sounds would come from a forbidden chamber long past midnight. These sounds were accompanied by infernal sparks; the kind of freshness in the air that follows a thunderstorm would spread through the house.

Moreover, it was whispered that the Matveyevs had a magic knife, the Indian girl's dowry. No one really knew what kind of a magic knife it was until it came the turn of Arseny Matveyev, great-grandson of Fedor Matveyev and his Indian wife, to graduate from the naval school in St. Petersburg. The young warrant officers hired a room in a tavern on the Moika for a bachelor supper party to celebrate their graduation. They made a great many fiery speeches over the wine. They recalled adventures from their cruises, for all of them had

sailed in seas near and far as naval cadets.

At the height of the party Arseny Matveyev placed his swarthy hand on the table, palm downwards, snatched a knife from a scabbard inside his shirt, and plunged it into his hand right up to the hilt. Then he quickly returned the knife to its hiding place and held up his hand. It bore no trace of a scratch, no sign of blood. Afterwards, the young revelry-makers could not say for sure whether they had actually seen this or whether it was a product of their wine-heated imaginations.

However that may be, Arseny Matveyev and his knife were soon forgotten. Napoleon's army invaded Russia. The years that followed were wreathed in the gunpowder smoke of danger and martial glory.

But there was one person in St. Petersburg, a man always dressed only in black, who thought constantly about the miraculous knife. From trusted men he received periodic reports about Arseny Matveyev, wherever the latter happened to be.

The man in black was Count Joseph Marie de Maistre, Ambassador of the King of Sardinia (a king who had been deprived of his realm) and an important personage in the Society of Jesus.

Before the War of 1812 there had been a Jesuit school in St. Petersburg where, for a high fee, quite a number of young men from distinguished families learned Latin prayers and Bible history, plus obedience and humility. When graduates of the school entered the government service they did not forget their spiritual fathers.

Young Prince Kurasov visited Count de Maistre perhaps more often than others. He was the one who told the Sardinian Ambassador about the

miraculous knife. The prince had been one of the few non-naval men invited to the supper party and had seen Arseny Matveyev plunge the knife into his hand.

The prince's story gave Count de Maistre much food for thought. A knife that passed harmlessly through a hand? The elderly Jesuit believed as firmly in divine signs as he did in the glorious predestination of the Society of Jesus, vigilant guardian of the faith and thrones. This was certainly a sign from on high. Just as the knife had passed through human flesh, Jesuits would pass without hindrance into the palaces of monarchs and into the chambers of high officials to persuade them to stamp out free thinking. The time had come to put a stop to the anti-religious sciences that had so multiplied. These Devil's instruments advocated the Jacobinism that destroyed thrones. The time had come to make men's hearts humble before divine Providence. The time had come to elevate the Society, despite the persecution to which it was subjected, despite the blindness of some rulers. The great honour of bringing this sign to the attention of the Society had fallen on him, Count Joseph Marie de Maistre.

The Count resolved not to let Arseny Matveyev disappear from view. Through scraps of information brought him by other graduates of the school he followed the young man's fortunes in the war. He knew that Arseny had been wounded, had convalesced at his estate at Tver, had been recalled to the Baltic Fleet, promoted to the rank of lieutenant, and was now stationed at Kronstadt, near St. Petersburg.

One day in March 1815 a carriage drew up to the Sardinian Ambassador's residence, and a tall,

thin-faced man stepped out of it. Fastidiously skirting a large puddle of melting snow, he mounted the steps leading to the front entrance. The Count received him at once. The thin-faced man bowed respectfully as he entered the Count's study.

The Count was sitting in a deep armchair before the fireplace. He turned his lined, parchment-yellow face to the newcomer and indicated a chair with a wave of his hand.

"What is the news, *mon prince*?" he asked in a weary voice.

Young Prince Kurasov seated himself on the edge of a chair.

"The news is fairly good, Your Excellency," he said wanly. "I have learned that Arseny Matveyev does not carry the knife about with him but has left it at Zakharino, the family estate. He has been appointed senior officer on the brig *Askold*, now being outfitted at Kronstadt preparatory to cruising in the Pacific Ocean in search of new lands."

The Count lowered his eyelids. "Is that all?"

"No. Now comes the most important news. Three days ago, in the company of philosophers and atheists like himself, Arseny Matveyev made seditious speeches. He spoke in favour of the convocation of a general assembly in Russia."

Count de Maistre sat up straight and struck the arm of his chair with his frail fist. The eyes in the yellow face glowed with an evil and unexpectedly youthful sparkle.

"It seems to me, Your Excellency," Prince Kurasov said cautiously, "that it would be well to set things in motion—"

The Count stopped him with a gesture and became lost in thought.

"No, *mon prince*," he said after a long interval, "we'll take a different course. When does the lieutenant depart on the brig?"

"In June."

"Splendid! We've waited a long time, and we can wait a little longer, until June. The matter must be arranged without undue fuss. Do not disturb Arseny Matveyev."

A little over two and a half years later, on a hot day in February, the brig *Askold*, badly battered by severe storms, dropped anchor at Rio de Janeiro. There the Russian Consul handed Arseny a letter from his father that had arrived nearly two years before.

"I shall briefly set forth the misfortunes which have befallen our house, not through God's will but because of the evil designs of wretched creatures," his father wrote. "You of course remember Prince Kurasov. He used to be a friend of yours. Fawning and deference have enabled this man Kurasov to rise to the higher ranks and, some say, to involvement with the secret police. Out of spite, or for some other reason, Kurasov has informed against you, repeating everything that you said in your youthful hastiness and naming the books you read. This denunciation brought officials to Zakharino. They searched the house from top to bottom, turning everything upside down, under the pretence of looking for seditious papers.

"But it seems to me that they were looking for something else. Since they did not find any papers

of that kind some of those hounds ransacked our special chamber most painstakingly. They examined the electricity machines from all sides. Furthermore, they confiscated the manuscript in which Fedor Matveyev, my grandfather and your great-grandfather, described his Indian travels. They also confiscated that wonderful knife of his."

At the beginning of June 1818, after an absence of nearly three years, the *Askold* sailed into the roadstead near St. Petersburg.

Early next morning Prince Kurasov's valet announced that Lieutenant Matveyev wished to see him. The Prince, in his dressing-gown, was being shaved by his barber.

"Tell him I'm not at home," he ordered.

A few minutes later there was a commotion downstairs, and the valet's raised voice could be heard. Then the door was flung open. Arseny Matveyev, his cheeks tanned a deep brown, stood on the threshold. He was in uniform, with a sword at his side. Prince Kurasov pushed aside the barber's hand and slowly rose to his feet, wiping the lather from his cheek. Arseny looked at him with burning eyes.

"Is this how you welcome old friends, Prince?"

"Please leave the room, sir," the Prince said coldly. "You should thank the Almighty you got off so easily."

Arseny put his hand on his sword-hilt. "I give you exactly one minute to hand back the souvenirs you took from my father's estate," he said with restrained fury.

The Prince's narrow face turned whiter than his lace cuffs. He took several slow steps backwards, towards his canopied bed, and stretched out his hand to tug at the bell-rope. In two bounds

Arseny, his sword drawn, was at the Prince's side.

Meanwhile the barber had fled, whimpering, from the room.

The Prince, frightened out of his wits, stammered that the things confiscated during the search had been turned over to Count Joseph de Maistre, the former Sardinian Ambassador.

"Where does that Jesuit reside now? Tell me, quick!"

"The Count left Russia last year," Prince Kurasov replied sullenly. "I do not know where he is now."

Arseny spent only a short time in St. Petersburg. He tendered his resignation and left for Zakharino.

The warm September day was drawing to a close. Candles had been lighted in the small snow-white Villa standing in a garden on the edge of a town in northern Italy. Their flickering glow was reflected in the mahogany panels that lined the walls of the study. A spare old man in black stood leaning against an elegant table, examining a sheet of parchment which he held close to his eyes. Another man, portly and somewhat younger, stood to one side, waiting.

"My friends were not mistaken in recommending you and your erudition to me," the old man said, laying the sheet of parchment on the table.

The scholar bowed.

"You have done the Society of Jesus a great service," said the old man, taking a purse out of a drawer in the table.

"*Ad majorem Dei gloriam*," the scholar said, accepting the purse. "I wish Your Excellency a good night."

After seeing his visitor out of the room the old

man summoned a servant and told him to close all the shutters in the house and kindle a fire in the fireplace. In his old age Count de Maistre suffered greatly from the cold.

He sat down at the table and again examined the parchment. He was pleased. The old riddle brought back from cold Russia had been given an excellent interpretation. He could already foresee the great day when the glory of the Society of Jesus would shine as never before. He, Count Joseph de Maistre, had not toiled in vain these many years.

The clatter of horses' hooves on the stony road not far away came to his ears for a minute or so.

Opening a carved casket, the Count removed from it a rolled-up manuscript tied with a ribbon, and a knife with an ivory handle. Then, one after another, he took out three small iron boxes and gazed admiringly at their gleaming sides. A master craftsman in Turin had fashioned them according to his design, and on each box had engraved the initial letters of the great motto:

A M D G

Below it he had engraved Count Joseph de Maistre's crown and his initials:

J d M

The Count placed the rolled manuscript in one of the boxes, muttering: "The Source".

Then he cautiously took the knife by its handle and laid it in the second box: "The Evidence," he said.

"And this—" he neatly folded the parchment which the scholar had brought— "and this will be 'The Key to the Mystery'."

All of a sudden he glanced with a start at the dark window. He thought he had heard the crunching of pebbles. But no, all was quiet.

The Count placed "The Key to the Mystery" in the third box. Now he had only to close the covers and have them sealed.

He heard a rustle outside the window. Was it the porter making his rounds?

The Count went up to the window and flung it open, but instantly started back with a cry. A man in a cloak and a wide-brimmed hat was staring at him from the shadow of an old hornbeam. He was young and swarthy, and his dark eyes gleamed fiercely at the Count.

"You have vigilant guards, Count," he said in French. "I was forced to climb over the wall. Do not be afraid. I am not a robber."

The Count had recovered somewhat from his fright. "Who are you, sir? What do you want in my house?"

"My name is Arseny Matveyev. Now you know what I want."

Fear distorted the Count's yellow face. Suddenly, with an energy unexpected in such an old body, he dashed to the table, on which his pistol case lay.

By this time Arseny was in the room.

"Stop where you are, Count!"

The unbidden guest whipped out a pistol from under his cloak and aimed it at the Count, who took a step backwards. Realizing that the game was up, the old Jesuit said in a gentle voice:

"It is not becoming, my son, to threaten an old man with a pistol. Someone has evidently misled you."

"Silence!" Arseny Matveyev barked. "I didn't

travel the length and breadth of France and Italy searching for you just to listen to your miserable evasions. Put the knife and the manuscript on that table. I'll count to three."

"There is no need," the Count said dispiritedly. "They are lying on the table."

Arseny strode over to the table. His eyes sparkled with joy at sight of the knife.

"The manuscript is in that little box," said Count de Maistre. "Don't touch the third box. It is mine."

"I am not a Jesuit. I do not covet what belongs to others," Arseny snapped, this time in Russian. "Take this for your iron boxes."

He tossed a gold coin on the table. Then he closed the covers of the two boxes, one containing the knife and the other the manuscript, and thrust them into his pockets.

"Don't you dare to raise the alarm, you old fox," he said as he turned to leave. "If you do, you'll get a dose of lead."

With those words Arseny Matveyev jumped down from the window. Soon after, the sound of horse's hooves on the stony road faded into the distance.

On returning to Russia, Arseny Matveyev was unable to get down to a thorough study of the secret which his great-grandfather had brought from India. Other affairs absorbed him. After his father's death he freed the few serfs the family owned and turned over the estate to his younger brother. He had the two small iron boxes reliably sealed. Then he moved to St. Petersburg, where he joined a secret society of revolutionaries.

On December 14, 1825, after the failure of the December uprising in St. Petersburg, Arseny

came galloping into Zakharino in the night. The next morning gendarmes broke into the house. As they led Arseny out of the house, under arrest, he only had time to whisper to his brother: "Guard those two little iron boxes like the apple of your eye. Farewell."

Arseny Matveyev was exiled to salt mines in Siberia. He never returned from there.

"All I know," said Rita, "is that Arseny brought home two small iron boxes from abroad, and they were in the possession of the Matveyev family ever since. No one knew that anything was inside them. When my husband and I started packing our things before moving to our present flat, the knife suddenly dropped out of one of the boxes. Mother threw the other box away along with a lot of old junk. It was dirty and rusty and had been used to prop up an old wardrobe with a broken leg. Who could have guessed there would be a manuscript inside?"

"Did you ever hear anything about a third box?" Nikolai asked.

"No. That's why I was so surprised when you and Yura came to ask me about it. What do *you* know?"

"Only that it exists."

Nikolai then told Rita about the Italian subversive agent and the theft in the museum.

"There was something very important in that third little box," he said in conclusion. "De Maistre called it 'The Key to the Mystery'."

The other passengers in the carriage had gone to bed. The plump conductress was sweeping

the corridor. They continued to stand by the window, watching the snowbound night fly past, marked off by telegraph poles.

Nikolai reflected in amazement that here was Rita standing by his side, elbow to elbow, no longer an infinitely distant stranger but Yellow Lynx, an old friend from his childhood. Yet still in all a stranger.

"Look here, Nikolai," Rita said suddenly, pressing her forehead to the glass and closing her eyes. "Can I trust you?"

He wanted to say that he was ready to jump off the train into the darkness then and there if she asked him to.

"Yes," he said.

Rita was silent for a while. Then she threw back her head. "I feel as though I'll burst into tears in a moment if I don't tell someone—"

She then proceeded to tell him, without holding anything back, about the misfortune that had befallen her. She told him how Anatole had started to study the knife and how she had encouraged his ambition. How, desiring to increase his working capacity, he had become a drug addict. How she had jumped overboard after the knife, caught it in the clear water, hidden it under her dress and told her husband it was lost because—so she had thought—without the knife he would not be able to continue his investigations. How she had urged Anatole to give up those accursed experiments, but instead he had joined up with Opratin and was wearing himself out with work and with drugs. How he had walked out of the house. And finally, she told Nikolai how she had given Opratin the knife the previous day in the hope that this would help them to com-

plete the project sooner, after which Anatole would return to her.

"You gave the knife to Opratin!" Nikolai exclaimed.

Rita measured him with a long look.

"Promise me you won't tell a soul about any of this. Not a single soul. Not even Yura."

"But why, Rita? Why keep silent? On the contrary, something has to be done. We must convince your husband that such single-handed experiments aren't fruitful. We must persuade him to switch to our Institute."

"No," she said. "He wouldn't pay any attention to that kind of talk. It would only make him still angrier."

"He wouldn't listen to me, of course. But he would to Privalov and Professor Bagbanly."

"No, you don't know him," Rita repeated insistently. "You must promise to say nothing. I demand it."

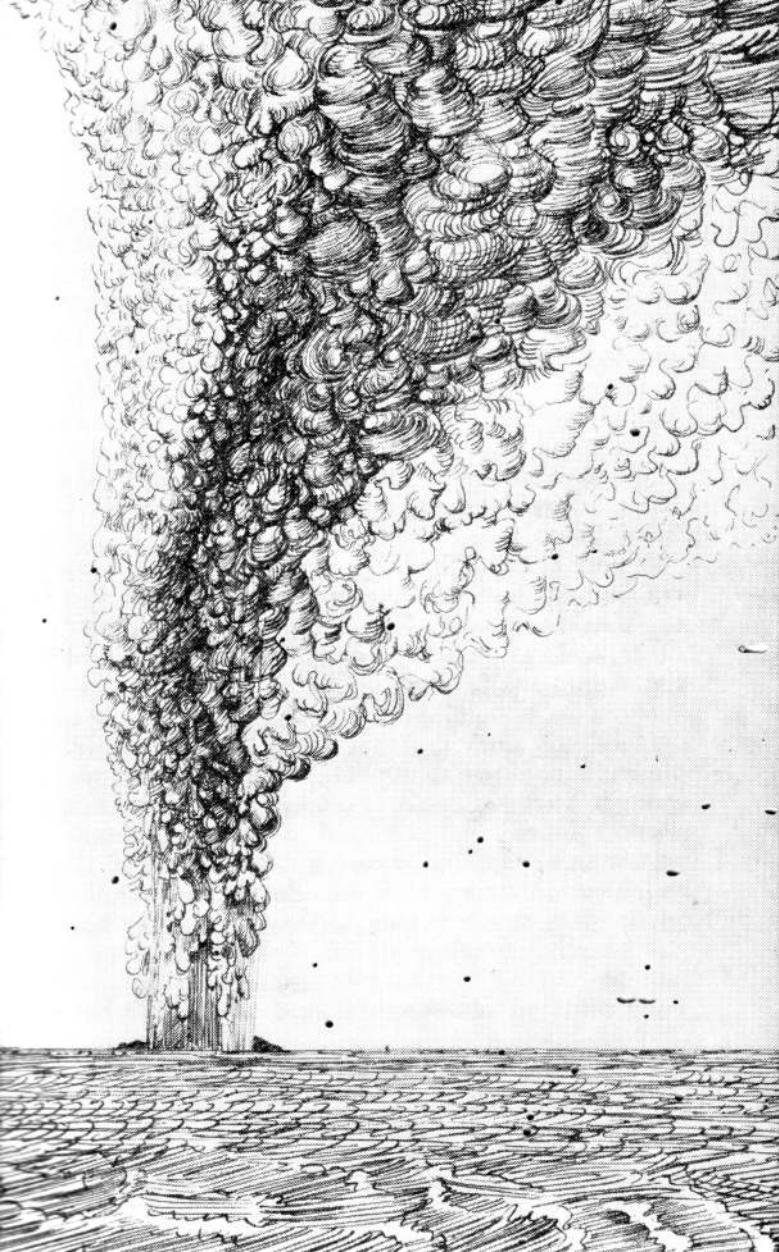
"Very well," said Nikolai in a downcast voice. "I promise."

4

IPATY ISLAND

"They unfurled their canvas sails
And sped across the Caspian Sea."

—From the Russian epic poem
Vassily Buslayevich



CHAPTER ONE
IN WHICH PRIVALOV'S LABORATORY IS BLOWN UP

Valery Gorbachevsky felt, on that lovely day in June, that his bottle-green sun-glasses were rose-coloured. His leave of absence to take his correspondence college exams was over, and everything had gone well, if you closed your eyes to a mediocre mark in English.

He was now on his way to work after an interval of twenty days. He was walking fast because he had had to stop at the library, which opened at eight o'clock, to return some textbooks, and he was afraid he would be reprimanded by Nikolai Potapkin for being late.

Valery skirted the bed of gladioli near the entrance and flew into the lobby. He dashed past the cloakroom, with its thickets of nickel-plated racks, and past the time-board, now closed, hoping that speed would enable him to avoid the timekeeper.

It did not work out that way. The timekeeper, pleasant-faced Ella, was at her place. Strangely enough, Yura Kostyukov, incredibly handsome in cream-coloured flannels and a new green-and-yellow checked shirt, was sitting beside her. Still under the influence of Fedor Matveyev's manuscript, Yura was amusing himself by paying the girl courtly compliments in eighteenth century fashion. Ella did not understand half of what Yura said but she was flattered and could not stop giggling.

When Yura caught sight of Valery he turned with great dignity to glance at the clock.

"Please note, Ella," he drawled, "that this man,

returning from a leave of absence, has arrived eleven minutes late but does not look the least repentant."

"What the hell are *you* doing here?" Valery wondered disrespectfully. Out loud he said the first thing that came into his head. "The trolleybus—"

"Ah, to be sure, to be sure." Yura nodded understandingly. "I hadn't thought of that. But fate is always merciful to the lazy ones." He drew a folded sheet of paper from his breast pocket. "Here you are. This is for you."

"My annual vacation?" Valery said, reading the paper. "But I don't want it just now."

"There are times when the management has the right to insist that the personnel go on vacation even if they don't want to," Yura said in a tone of mock authority. "I didn't ask for my vacation either. Neither did any of the others".

"All of us? The whole laboratory?"

"At nine o'clock you'll be able to draw your vacation pay. And don't ask idle questions."

"I'll step into the laboratory meanwhile."

"Follow my example, young man, and restrain your zeal."

Yura was right. Managements do have the right, when circumstances arise that prevent the normal functioning of a factory shop, office or the like, to insist that members of the staff take their annual vacation regardless of any schedules that may have been drawn up previously.

In this case the circumstances had been the following:

After Privalov and Nikolai returned from Moscow the development of a pipeless oil pipeline

had been included in their Institute's research programme. Since the main research was being done at the Institute of Surfaces in Moscow, cautious Pavel Koltukhov forbade experiments in this field.

"The devil take the lot of you!" he exclaimed in reply to Privalov's arguments. "I'm fed up with your delightful habit of sticking your finger in other people's pies. First thing I know your lab technician will be putting his head in an inductor, and I'll have to answer for it."

When a thick envelope arrived from Moscow towards the end of April the Institute director summoned Koltukhov and Privalov to a conference. When Professor Bagbanly arrived shortly afterwards he was also shown through the massive leather-covered door of the director's office. The conference lasted for hours. First glasses of tea were carried in, then bottles of mineral water.

Yura appeared in the reception room after lunch. "Smells like something burning," he remarked with a glance at the closed door, wrinkling up his nose.

The secretary did not pause in her typing. "Run along now, Yura," she said. "They'll manage without you."

Yura went back to the laboratory.

"Something's cooking in the director's office, Nikolai," he whispered to his friend. "They've been at it since morning. Boris forgot all about his yoghurt during the lunch break. It's probably news from Moscow. Listen, can't you tear yourself away from your slide rule? What's the matter with you, anyway?"

Nikolai said nothing. He studied his unfinished drawing with exaggerated attention. The curve

he had just plotted reminded him of a wind-filled sail. This association brought back a picture of the high white side of the *Uzbekistan*, and a slender figure in a red sun-dress diving into the sea. Also, a picture of melancholy dark eyes.

Nikolai drew his hand across his forehead.

Rita had once been simply a stranger, gradually to be forgotten, driven from his mind. But now—now everything was all confused. No matter how he tried he could not forget her. She was no longer a stranger. She was Yellow Lynx, a childhood playmate.

Nikolai had hardly seen her since their return from Moscow. She had phoned him several times at work. He had asked her, in a wooden voice, how life was treating her. She had told him that Anatole had returned home and had promised her to go into hospital for treatment as soon as he finished the job. Anatole's work was going along well. Rita spoke about it in a gay, animated voice. Nikolai was glad for her sake. But every time she rang up he experienced pain.

One day Rita invited Nikolai and Yura to drop in for tea. She wanted to introduce them, her childhood friends, to her husband.

Nikolai had never seen Anatole before. He was struck by Anatole's unhealthy colouring, the bags under his eyes, and his dull glance.

Anatole picked languidly at the cake on his plate. He took no part in the conversation. Nikolai was dying to ask him about Fedor Matveyev's knife, but that question and many others on the tip of his tongue could not be asked because of the promise he had given Rita.

Anatole turned his lacklustre eyes on Nikolai. "Has your apparatus produced any sort of long-term penetrability?" he asked.

Nikolai almost choked in surprise. He hurriedly chewed the piece of cake in his mouth. "I don't really know," he replied. "We turned everything over to the Academy of Sciences."

"How are your experiments coming along?" Yura politely asked Benedictov. "When will we be able to offer you our congratulations?"

"How can we compete with the Academy?" Anatole asked glumly.

Yura twitched his blond eyebrows. "Why compete? Join us. The days of ivory-tower scholars are over. Modern scientific problems are so—"

Anatole interrupted him. "You're too young, far too young, in fact, to tell me which days are over and which aren't." He frowned. No one said anything. Rita hurriedly changed the topic. "You boys are going to tomorrow's concert at Philharmony Hall, aren't you?"

But this did not help. The afternoon was ruined. Soon after, Anatole rose, complaining of a headache, and left the room.

Yura could see what was troubling Nikolai, but for the first time in their many years together he could think of no way to help his friend. He even went so far as to ask Val's advice, but she viewed the matter rather disdainfully. She did not seem to like this newly-found playmate of their childhood.

The envelope that had come from the Institute of Surfaces in Moscow really did contain interesting news. The frequencies which had influenced

the Cooper Lane installation had been ascertained. What had been vaguely hinted at in the clumsy experiment mounted by the young engineers had been translated into the language of formulas and figures. The workers at the Moscow Institute had obtained their initial result: the rods pressed together in the field of the Möbius band had penetrated each other, although not deeply. They felt that their southern colleagues could begin experimenting with liquids.

The cautious Koltukhov surrendered. He gave Privalov the go-ahead to set up an experiment.

Preparations took all of May and half of June. An apparatus having a glass coil mounted inside the stator of an electrical machine was installed in one of the rooms of Privalov's laboratory. A Möbius band of yellowish metal, a metre and a half long, was placed beside the stator. Behind the band there was an aluminium disc, a condenser screen linked up to a powerful electrostatic generator.

The glass coil was filled with water and connected to a small drum of oil.

The idea was that penetrability—in this case, permeability, to be more precise—would arise in the field of the Möbius band, that is, the oil would flow through the water in the coil. This would be the model of a pipeless oil pipeline, a model of complete diffusion of liquids with reorganized internal bonds. The particles of oil would pass freely through the particles of water.

The Institute of Surfaces believed there ought to be a certain amount of external excitation of the field when the installation went into operation. A hard gamma beam would be suitable, Academician Georgi Markov thought. And so, a lead

container with an ampoule of a radioactive substance inside it had been suspended beside the Möbius band.

Chief engineer Koltukhov had the control panel and measuring instruments moved into an adjoining room. He himself locked and sealed the door of the room in which the installation stood.

During the first few days different types of operating conditions were tried out, but with no results. The oil that was pumped into the coil simply pushed the water out of it.

The eventful day started just like the others. The men took their places at the control panel, and Yura switched on the television transmitter. The Möbius band and the glass coil appeared on the screen.

"Attention. All set. Let's start," said Privalov. "The container."

The electrician pressed a button. In the next room an electromagnet removed the lid of the lead container and a flux of gamma rays streamed towards the border area of the oil and water. The ruby eye of the radioactivity indicator began to glow.

"Now the static charge!"

A switch clicked, and the generator on the other side of the wall began to whine. A green zigzag appeared on the rounded bottom of the cathode-ray tube of the oscillograph in front of Nikolai and crept to the right, along the scale. Nikolai turned the knob to hold the zigzag in place.

"Let's have frequency 230, Nikolai," said Privalov.

Moving from one frequency to the next, Privalov patiently proceeded through the programme planned for that day.

Suddenly Yura leaned forward to the screen. The borderline between the dark oil and the transparent water had become smudged.

"It's begun!" he whispered tensely.

All eyes turned to the screen. It did look as though the oil was no longer pressing against the water, pushing it ahead of itself, but was passing through it.

Privalov kept his eyes fixed on the pressure-gauge. Resistance was dropping. There was no doubt about it. One hundred and twenty grammes per square centimetre.... Seventy.... Fifty-two.... Glancing at the TV screen, he saw that the glass coil was cloudy.

Yura laughed jubilantly. "It's permeability, Boris!"

The water's resistance was rapidly dropping towards the desired zero.

Thirty-five..... thirty... Suddenly the needle quivered, then stopped at twenty-seven.

Privalov impatiently tapped the glass of the pressure-gauge with a fingernail. The needle was motionless, as though it had come up against an impassable barrier.

"Add five-tenths, Nikolai," he said in a low voice.

Nikolai gave the field intensity knob a slight turn. The green zigzag on the oscillograph screen climbed, but the pressure-gauge needle refused to budge.

"Some sort of threshold," Privalov said. "Let's have another five-tenths."

"Look!" exclaimed the electrician. "Just look at this."

They turned to glance at the electric meter. Electricity was being consumed at a much grea-

ter rate than usual. The meter was whirling so fast that the right-hand figures were a blur.

Privalov glanced at the ammeter. The needle was almost on zero, as though the installation had been switched off. But the electric meter was spinning faster and faster. The electricity from the mains seemed to be vanishing into a bottomless pit.

Koltukhov came up.

"It's simply being swallowed up," he said. "What's happening?"

The telephone rang. He picked up the receiver.

"Yes, this is me, Koltukhov. No, we haven't switched on any new machines. What? Yes, we'll have to. I'll call you back in five minutes."

He put down the receiver and turned to Privalov. "They're worried at the substation. Voltage in the district is falling. They've switched on their reserve but it doesn't help. The power loss is appalling and quite incomprehensible. Shall we stop the whole thing?"

The zigzag on the oscillograph kept climbing, although operating conditions had not changed.

"No!" Privalov kept his eyes glued to the zigzag. "Give us another one-hundredth."

The green zigzag jumped to the top of the frame. The meter was now screaming like a siren. The figures blurred into grey streaks. Suddenly the glass shattered and the meter flew to pieces. The electrician barely had time to cover his eyes with his hand.

A bright light flooded the TV screen. Yura involuntarily sprang backwards.

Privalov dashed to the main switch to turn off the installation but before he could reach it there was an explosion on the other side of the

wall. Plaster rained down on their heads. The floor shook. Privalov jerked the switch down and looked round. As he pushed back his hair with his sleeve he smeared his face with plaster dust. No one seemed to be hurt, or even particularly frightened, for that matter. It had all happened too suddenly.

"Turn on the TV receiver," Privalov said hoarsely. "Just the TV."

The screen lit up with lustreless horizontal bands. There was no image. Yura fiddled with the knobs.

"It looks as though the transmitter was knocked out," he said softly. "Along with everything else in that room."

"Close the container," said Koltukhov.

The electrician pressed a button, but the red bulb continued to glow.

"It doesn't close," he said. "Something's wrong with the electromagnet."

"Something's wrong with the whole thing," Koltukhov put in. Then, raising his voice, he said: "Everyone leave the room, please."

The corridor buzzed with alarmed voices. The director of the Institute came hurrying down the stairs.

"What happened?" he asked.

Leading him aside, Koltukhov and Privalov told him briefly about the explosion and what had preceded it.

"There's an open container inside that room," Koltukhov added. "The blast may have ejected the ampoule and smashed it. The walls are thick, but after all, that's 1,500 milligrams of radioactive matter—"

"Seal the laboratory and summon the emergency squad," said the director.

The damage done by the blast was relatively insignificant. Part of the floor was charred, plaster had fallen from the ceiling and walls, and the installation was wrecked. The copper cartridge with the ampoule inside it had flown out of its lead container, just as Koltukhov had said it might, and the radioactive matter had dispersed. That room, the two adjoining rooms, and the three second-floor rooms above them could not be used until everything had been rendered quite harmless.

Privalov's entire laboratory was closed down for the time being.

And so, Valery Gorbachevsky found himself taking a vacation before he had time to return to work eleven minutes late.

For a while he had thought Yura Kostyukov was pulling his leg, and he decided to go upstairs and see for himself. Before he had put his foot on the first step he saw Privalov coming down, carrying a small suitcase, with a raincoat over his arm.

"Goodbye," he said, offering Valery his hand. Then he shook hands with Yura and moved towards the outer door.

"For heaven's sake, tell me what happened," Valery begged Yura.

"Privalov's taking a plane to Moscow."

"What for?"

Yura did not know. He knew only that Privalov and Koltukhov, wearing protective clothing,

had entered the room and found something there that prompted them to go to Moscow at once. He also knew that a steel-bound crate had been shipped off to Moscow.

CHAPTER TWO

IN WHICH THE AUTHORS REMEMBER THEIR PROMISE TO ARRANGE A SHIPWRECK

At five o'clock in the morning the city on the horseshoe-shaped bay was still asleep. A mist hovered above the grey water of the harbour and the black hulks of the barges in the roadstead. But the red and gold fires of a new day were beginning to blaze in the east.

Carrying small suitcases, Nikolai and Yura, accompanied by Rex, approached the entrance to the marina. Valery Gorbachevsky, outfitted with a transistor radio and fishing gear, was already waiting for them.

At the far end of the pier, dockmaster Mehti sat leaning against an overturned boat. His tanned, large-featured face looked like old bronze. A grey halo fringed his round, mahogany-coloured bald spot. His striped jersey, ring in one ear, intricate tattooing on his arms, and the knife in his hand made him look as though he had just stepped out of a story by Robert Louis Stevenson.

A large sun-cured fish and a tin filled with small lumps of sugar were neatly set out in front of him on a clean white cloth. Strong tea steamed in a mug. The dockmaster was cutting a loaf of fresh unleavened bread into thick slices.

"The terror of the seas is taking his morning

grog," Yura whispered to his companions. Aloud he said:

"Good-morning, Mehti."

The dockmaster turned a bright black eye on the newcomers and nodded.

"We made the boat ready yesterday," Nikolai told him. "Everything's shipshape."

"That's what you think," Mehti said sternly. "I'll take a look and see. Have a snack with me."

The young men sat down beside him and were each handed a mug of tea.

"Taking music along with you, I see," Mehti remarked, glancing at the transistor set.

"Yes," Yura replied. "Besides listening to music we'll keep in touch with the world while we're out at sea."

Mehti said nothing. He put a sizable piece of cheese into his mouth and chewed it thoughtfully.

After breakfast they set out to inspect the boat.

The *Mekong* lay at anchor some two hundred metres from the pier. The dockmaster walked over to the edge of the pier with his rolling gait and stepped into a dinghy. The young men followed him.

Mehti had paid no attention to Rex up until then. Now he said, "That dog will have to get out."

"But why?" Yura protested. "Rex is a fine dog."

"Fine dogs stay at home. They don't go to sea."

"He'd die of a broken heart if we left him at home, Mehti."

"He didn't die whenever you went sailing without him before, did he?"

"Oh, Mehti, please let us take Rex. Rex is really a nautical dog."

"The next thing I know you'll bring a donkey and try to tell me it's nautical too," Mehti retorted. "Put that dog ashore at once."

This was done. Valery, who was quietly enjoying the scene, then untied the painter at the bow. Energetic strokes of the oars carried them out to the sailboat.

Mehti painstakingly checked every knot and every lanyard. Finally he pronounced the boat ready to sail.

Nikolai and Yura left Valery aboard the *Mekong* and returned to the clubhouse, where Mehti put on his spectacles and opened his register.

"Here," he said to Nikolai, poking a fingernail at a clean page, "write down the number of people aboard, list their names, and state where you're sailing to and for how long. Then sign that you have permission from the port authorities, that you were given a copy of the latest weather forecast, and that you have the necessary maps and charts."

Now that they were so unexpectedly on holiday our friends had decided to make a voyage along the coast, to the mouth of the river Kura. If the wind was right they would continue farther south, as far as Lenkoran, and visit the botanical gardens there. En route they intended to stop at some of the islands in the archipelago.

Valery, a newcomer on the *Mekong*, was terribly excited about the cruise. He had practically memorized Yura's sailing manual.

Val had also expressed her delight at being invited to come along.

One evening, two days before they were to sail, when the men were at Yura's house checking their route and their lists of gear and provisions, Nikolai suddenly pushed the map aside and reached for a cigarette.

"Let's invite another passenger," he said, lighting his cigarette.

"Okay," said Yura, who guessed at once whom Nikolai had in mind. "Ring her up."

"It would be better if you did. You're more persuasive."

Rita picked up the receiver at the first ring. "It's really nice of you to think of me," she said after Yura had invited her to come along on the cruise. "But I can't be away from town for any length of time."

"It's just for a week, Rita. The school vacation has begun, hasn't it?"

"Oh, Yura, I'm so sorry, but I simply can't. Thanks for the invitation, though. And remember me to Nikolai."

She put down the receiver, settled herself in her favourite corner of the sofa, her legs under her, and opened her book. Her eyes ran down the lines but the meaning of the words did not sink in.

She was alone again. Anatole had not been home for two weeks now. They hadn't quarrelled, it wasn't that. She looked after him to the best of her ability and did not ask him any questions. She realized that he was ashamed to take the drug in front of her but could not get along without it. He often made long trips to some sort of special laboratory. A hitch had cropped up in his work again. He spent the nights at Opratin's, where he never heard any reproaches.

The next morning Rita went to the Institute

of Marine Physics. Anatole was not at his desk, and she had to wait in the lobby a fairly long time before someone found him and he came downstairs.

"How clever of you to drop in," he said. He took her hand in his sweaty palm. His eyes were tender.

They stepped out into the garden and sat down on a bench at the edge of the lawn.

"Are you coming home tonight?"

His face darkened. "This is just our busiest time, Rita. We've done the main part of it. Now we have to make sure there are no flaws. It will take another few weeks—"

"Very well," Rita said sadly. "I'll wait."

"I'll be going out to the laboratory again in a few days. If it doesn't work— Then I'll collect all the material that's out there and try it a different way."

"I went to see Dr. Khalilov. He's willing to take you in whenever you're ready. The sooner you start, Anatole, the better—"

"I know. I know. Just wait a little." Anatole took her hand again. "Has the school vacation started already?"

"Yes." The instant Rita said this she remembered the previous day's telephone call. "I've been invited to go sailing, Anatole. Do you think I should?"

"Who invited you? Those childhood friends of yours?"

"Yes. It's a seven-day cruise along the coast."

"Go by all means. The change will do you good. Remember our cruise of last year?"

After a few more minutes of desultory conversation Rita said goodbye to Anatole and left. At

the gate she looked back. Anatole was standing at the edge of the sunflooded lawn, gazing after her. His arms hung by his sides.

On returning home Rita rang up Yura and told him she would be glad to join them.

As Nikolai finished writing his entry in the register and signed his name with a flourish they heard rapid footsteps.

"That's Val", said Yura. "Here we are, Val."

"Hullo, there." Val ran up, panting for breath. "I was sure I'd be late. How do you do, Mehti."

Mehti acknowledged the greeting with a nod, picked up the register, and disappeared with it into his office.

"What a glorious day," Val exclaimed. "I was worried I'd be late. Nikolai warned me so sternly yesterday about coming on time. Well, what are we waiting for? It's seven already, isn't it? Time to start."

"Let's wait a bit longer," Nikolai muttered. He walked to the edge of the pier, where he could look down deserted Seaside Boulevard.

"I see. That friend of your childhood, is it?" Val pulled a wry face and looked at Yura. "So you did invite that nut."

Yura spread his hands reproachfully.

"There she is," Nikolai cried as he caught a glimpse of a red sun-dress far down the boulevard.

Rita came up smiling, her face relaxed. She shook hands with everybody and patted Rex.

"You're a bit late," Val could not resist saying.

"It doesn't matter in the least," Nikolai put in hastily.

They walked to the end of the pier. Mehti was not in sight, so Yura pushed Rex into the dinghy and ordered him to lie down.

"Couldn't we do without Rex?" Val asked.

"Dogs need a change of scenery too," Yura explained.

As they approached the sailboat Rita read the name on its bow. "*Mekong*," she said. "Is it the same one?"

"The very same." Nikolai replied gaily as he helped her to climb on board. Then he snapped: "Make sail."

As they hauled the sheets home Yura and Nikolai pretended it was hard work and struck up an old sailors' chantey they had heard Mehti sing many times:

Sail to have a fast clipper.
Pull, boys, pull, boys!

With each "pull" they gave a tug in unison and the sail rose higher and higher.

Will you tell me who is skipper?
Pull, boys, pull, boys, pull!

"Regular pirates, they are," Val remarked.

"They do everything very neatly," Rita said approvingly.

"Of course they do. Sailing is their hobby."

The lines were belayed and the sail swelled tautly. The *Mekong*, listing slightly, glided off.

Nikolai sat at the tiller. Yura rose, planted his feet wide apart on the deck, thrust an arm forward and declaimed:

An unforgettable moment.
The breeze freshens,
We round the lighthouse.

You are so near, so dear,
Yet your hand I dare not touch.
In the water Cassiopeia's lights
Glitter like gold, and clouds sail by.

Valery gazed admiringly at Yura. Rita listened with a smile. Speeding before the wind into the sparkling blue morning gave her a deep sense of contentment.

"I'll be the taskmaster," Yura said. "Courageous Commodore Nikolai will sail our ship over the bounding main." He made Nikolai a deep bow. "I'm his first mate. And with your kind permission I'm also his fearless navigator. Valery will be our deck boy and vigilant lookout. Carnivorous Rex will, in case of mutiny, bite the lower limbs of the mutineers."

Hearing his name, Rex put out his tongue and licked Yura's bare foot.

"What about us?" Val asked. "How dare you rank us below Rex in your silly hierarchy?"

"But I don't. You and Rita will provide the crew with nourishing meals. In your spare time you can protect the delicate skin of your noses from the scorching rays of the tropical sun by pasting a strip of paper on them."

The boat sped out of the bay into the blue sea, its sail billowing. The city behind them disappeared into a bluish haze.

Yura lay down on the deck beside Nikolai.

"This is the very same place. Do you suppose that knife is still on the seabed?"

Nikolai did not answer. He was busy setting a new course.

"You're not bored, Rita, are you?" he asked.

She smiled at him. "Not at all. It's terribly

interesting. Everything's fine. You promised to teach me to steer the boat."

Nikolai handed her the tiller and showed her how to steer a course by compass.

"It's not easy," Rita said after a few minutes. "The boat won't obey me."

"Don't jerk the tiller, move it gently. Now turn it to port, that is, to the left. That's right."

"Grip the rudder tight," Yura advised.

Rita did not raise her eyes from the compass. "Why?"

"All sea stories say so."

Nikolai grinned. "Don't listen to him. You'd have a hard time gripping the rudder because the rudder is under the boat. What you're holding is called the tiller."

After several days at sea the two girls were able to walk a sloping deck and to light the primus-stove that swung in a hanger. They had finally come to believe that the boat was rocking and the primus-stove was almost motionless. Dinners were prepared according to Yura's recipe: a tin of meat was poured into a mixture of millet grits and potato cubes and cooked together. The crew of the *Mekong* ate this stew with great gusto.

The weather was perfect. No one aboard the *Mekong* wore anything more than the briefest bathing costume and sun-glasses. Before long they were all a deep bronze from the sun.

"Darwin was right," Nikolai remarked one afternoon. "He says, in his *Voyage of the Beagle*, that a white man bathing beside a Tahitian does not look at all impressive. A dark skin is more natural than a white skin."

Val lifted her head from her book. She opened

her mouth to say something but after a glance at Nikolai's dark brown shoulders she changed her mind.

Gradually the coolness between the two young women faded. Prompted by a feeling of feminine solidarity, Rita often took Val's side in the frequent debates aboard the *Mekong*. Sometimes the two of them went off by themselves, to the extent that this was possible on such a small boat, and held long conversations. Or rather, Val talked about herself and the thesis she was writing, and how annoying and unfeeling Yura was at times. Rita listened with an understanding smile.

The sun, the sea and the fresh air all had their effect. Rita developed a beautiful tan, she grew more relaxed. Her appetite began to horrify her. The anxieties and disappointments of the past few months were being pushed out of her thoughts by the sea and the sky.

One evening when the velvety black sky was strewn with diamonds and the *Mekong* was gliding across a smooth, dark sea, leaving behind a silvery wake, Rita sat in the stern, hugging her knees, while Nikolai half-reclined beside her. His watch was coming to an end but he was in no hurry to waken Valery, asleep in the cabin.

In the silence, broken only by the wash whispering softly alongside the hull, the words "Your hand I dare not touch" flashed through Nikolai's mind. He closed his eyes.

"I've been recalling our childhood," Rita said. "Calm, starry nights like this belong only to childhood."

Her voice seemed to float towards him from afar.

"What a strange power the sea has," Rita went on slowly. "You can actually feel it cleansing your soul."

"Your hand I dare not touch," Nikolai repeated soundlessly.

"Are you listening?"

Nikolai opened his eyes. "Yes."

"Now I am beginning to understand why there have been so many sailors in our family."

Val and Yura sat out of sight in the bow, behind the stay-sail. Val had her dark head on Yura's shoulder as she gazed enthralled at the sea and the stars.

"Look how bright it is," she whispered, pointing to a golden star.

"That's Venus," said Yura. "Did you know that the Greeks thought Venus was two stars? They called the evening star in the west Vesper, and the morning star in the east Phosphor."

"Oh dear, you always have something to say about everything. Why can't you just sit quietly and drink in the beauties of Nature?"

Suddenly she turned her head and peeped out from behind the stay-sail. "I wonder what they're talking about," she whispered. "Do you suppose they're on intimate terms with each other?"

"I haven't the faintest idea."

"Oh, Yura, do tell me."

"But I really don't know." Yura was compelled to add: "You women always want everything pigeon-holed neatly. In such cases it's best not to meddle."

The cluster of islands lay baking in the sunshine. The *Mekong* glided past Duvanny Island, where Stepan Razin and his men divided the

booty of the Persian campaign. They visited Bull Island to see the vast number of birds that nested there, and then dropped anchor on Los Island, where hot mud bubbled constantly in craters, some all of twenty metres in diameter. In places the mud tipped over the edge of its crater and flowed down to the sea in a brown rivulet.

"I had no idea all this rather frightening wilderness was so close to us!" Rita exclaimed.

It was noon. The wind had dropped, and the sun was blazing. The sails hung limp. Yura tossed a match into the smooth green water. It floated on the surface without drifting away from the boat.

Heat waves shimmered in the motionless air. The horizon had vanished in a haze; land could not be seen anywhere.

"What do you do if there is no wind for a long time?" Val asked.

"Haven't you read any sea stories?" Yura asked. "We eat up all our food and then draw lots to see who is the first to be divided up for dinner."

The talk turned to how long a person could live without food or water, and they recalled well-known cases of men who had survived many days alone at sea.

"I wouldn't be able to eat raw fish the way Dr. Alain Bombard did," said Val.

"If you had nothing else you'd eat it and like it," Yura retorted. "As for water, we have some miracles we can work if we have to."

"What kind?"

"A resin that turns sea water into fresh water through ion exchange. But there's no need to worry—it won't come to that."

"I'm not worrying."

There was still no wind. The sky was a milky white, as though it had been drained of colour. A fog crept towards them from the north.

"I don't like this dead calm," Yura said to Nikolai in a low voice. "Let's drop anchor. By evening there may be a current that will carry us off to where we don't want to go."

The water, as smooth and colourless as the sky, swallowed the anchor without a splash.

The storm broke without warning. Squalls of a raging north wind tore the fog to shreds and whistled menacingly in the rigging.

The entire weight of his body on the tiller, Nikolai held the boat against the wind. Yura and Valery took down the jib and ran up the hurricane sail. Then, bracing themselves on the pitching deck, they reefed in the taut mainsail with great difficulty. Valery was almost swept overboard at one point. The stays and shrouds moaned as the wind tore at them.

The *Mekong*, her mainsail tightly reefed, was driven southward. Waves swept over her and crested on her deck; the foam hissed and dissolved.

Rita and Val sat silent in the cockpit, pressed close together, staring at the wild sea.

On the water-swept foredeck Valery helped Yura to fashion a floating anchor from boathooks and oars which they wrapped in a staysail.

To be carried forward into the unknown, into the roaring night, across a sea strewn with reefs and submerged rocks, was terrifying. Holding to the tiller with difficulty, Nikolai tacked back

and forth. As she tacked, the boat lay on her side, her reefed mainsail dipping into the waves. Nikolai knew the keel was heavy and was confident they would not be upset. "Hold on tight," he shouted. "Don't be scared! We'll soon right ourselves!"

Each tack demanded tremendous exertion. Nikolai's muscles ached, his forehead was beaded with sweat.

He bore down on the tiller with all his might, overcoming the furious resistance of the waves.

"Hurry up there!" he shouted to Yura above the howling of the wind.

Suddenly a shudder went through the boat. There was a grinding sound under the keel; boards snapped in two, the mast came crashing down. All these sounds almost drowned out a short cry—but Nikolai heard it. He dashed forward along the listing deck, pushed Valery aside and jumped overboard. A breaker washed over him, the undertow tugging at his legs. But he managed to touch bottom with one foot. Looking up, he caught a glimpse of a beach a short distance ahead.

The wave rolled Nikolai back beside the *Mekong*. He dived and felt along the pebbly bottom. In another moment his head was out of the water and he had Yura in his arms. But, unable to keep on his feet, he sank to his knees in the water. He rose again, now standing chest-deep, and shouted breathlessly: "All ashore! It's shallow here! Rope yourselves together!"

Carrying the unconscious body of his friend over his shoulder, he was knocked off his feet again and again by the waves as he stumbled along a sandbar towards the shore.

The *Mekong* lay on its side. The three on board clung to whatever they could lay hands on. Rex, pushed up against the cabin handrail, whimpered softly.

At the sound of Nikolai's voice Valery recovered from his fright. Now he was the senior crew member aboard the boat.

"Listen, you girls!" he shouted. "Everything's all right! We'll go ashore."

He tied the end of a sail sheet round his waist, then roped Rita and Val to it and ran the other end through Rex's collar. He jumped out of the boat and helped the girls to do the same. The three of them staggered towards shore, Rita carrying Rex.

Finally they came ashore. Still roped together, they climbed a clay slope. On the other side of the hillock they took shelter from the wind in a hollow. The sand in the hollow was surprisingly warm underfoot.

Here they saw Yura lying on the sand. Nikolai was energetically giving him artificial respiration.

Val dashed forward. "Yura!" she cried wildly.

CHAPTER THREE

IN WHICH THE MÖBIUS BAND THAT SANK INTO CONCRETE IS EXAMINED

To save the reader unnecessary anxiety, we announce here and now that Yura survived the ordeal.

Meanwhile, the action shifts to Moscow. Boris Privalov and Professor Bagbanly arrived in the capital by plane several days before the heavy steel-bound crate.

From the airport they drove straight to the research centre in which the Institute of Surfaces was situated. Rooms had been reserved for them in the hotel there.

"What do you say now?" Privalov asked Academician Markov after he had looked through the records of the experiment.

But the Academician refused to be hurried. "We'll examine your latest miracle first." Turning to Professor Bagbanly, he remarked, "I haven't seen you in Moscow for quite a time, have I?"

A few days later, in the middle of the afternoon, a lorry drove into the yard of the Institute workshop and a crane lifted a heavy crate out of it. What the Institute employees saw after the crate had been opened up was a block of concrete. It had been the support on which the Möbius band stood during the experiments. Now a yellowish metal arc about the size and shape of a pail handle jutted up from it. The remainder of the Möbius band had sunk into the concrete.

Academician Markov slowly ran his hand along the arc. His hand passed through the metal. All he felt was something like a warm, gentle puff of air. The sensation was not unfamiliar to him. The Institute experiments had already produced several models of restructured matter.

When they cut the block in two they found that the section of the band which had sunk into the concrete was impenetrable. Analysis showed, however, that all the elements found in concrete were present in the area occupied by the band. The atomic-molecular systems of concrete had filled the interatomic spaces in the metal. This was penetrability.

"It's a fantastic, unprecedented mixture," the

Academician remarked the next morning as he looked through the analysis report. "Yet it actually exists."

"The Möbius band came into the zone of its own action," said Professor Bagbanly, "and therefore it sank into the concrete."

"Yes, you could say that the band devoured itself."

"But why did it get stuck?" asked Privalov. "Why didn't it go in deeper, through the floor and then through the earth too, for that matter? How did gravity act on it?"

"Gravity? How little we know about gravity! We may suppose, of course, that the band descended until it reached some sort of limit, where it encountered repulsive forces."

"The energy limits of penetrability," Professor Bagbanly suggested.

"Yes, the energy limits." Academician Markov took a sheet of squared paper from a folder and placed it in front of his visitors. "I asked our power experts to make a chart of the phases of your experiment. This curve is power consumption," he said, pointing to it with his pencil. "You can clearly see the moment when consumption skyrocketed."

There was silence for a while as all three studied the chart.

"The moment when matter absorbed energy, to be more exact," the Academician went on. "An energy abyss, if you wish. You simply did not have enough energy to fill it."

"What if there had been enough?" Privalov asked quickly.

"Then I believe the experiment would have continued calmly to the end." The Academician

pointed a long finger at Privalov. "You did not complete the process of restructuring the internal bonds of matter. The process exploded backwards, returning the energy—not only what had been expended but also the energy of the surface."

"That means we—"

"Yes, Boris. What you called an explosion was the surface energy. Do you recall, last winter, my mentioning a new power source? Well, you obtained it."

Professor Bagbanly tapped the chart with a fingernail.

"This section of the curve must be reduced to a dot."

"Yes, but if we are to reduce the time factor the process must have an independent and sufficiently large power supply."

"What kind of supply?" Privalov asked.

"I don't know yet."

That evening Academician Markov rang up the hotel and invited Bagbanly and Privalov to visit him at home. He met them in the front garden of his attractive little cottage and led them into a simply furnished sitting room. Tea was served.

Over the tea and cakes the Academician said: "I should like to tell you a rather curious story. Or would you prefer to watch telesivion?"

"I vote for the story," said Professor Bagbanly, setting down his empty cup and preparing to listen.

"Well, here it is. While I was rummaging through my collection of old manuscripts the other day I came across a strange Chinese tale. Excuse me a moment." The Academician left

the room, returning a minute later with a folder. "I do not possess the original manuscript, unfortunately. It is a rare collector's item; the characters are embroidered on silk. This is a photographic reproduction I brought back from India a few years ago."

The guests examined the copy of the manuscript with interest.

"Here is the translation." The Academician produced a sheaf of papers from the folder. "Let me read it to you."

The Story of Liu Ching-chen, Seeker of Complete Knowledge

Liu Ching-chen dedicated his life to seeking Truth and Knowledge. He mastered all the sciences and all the natural elements: metal, wood, fire, water and earth. He knew there existed three worlds: Desire, Colour, and Colourlessness.

He often gazed at the moon. On clear nights he saw, in the moon, a jade hare pounding a drug in a mortar. Liu Ching-chen knew that anyone who took this drug would gain immortality. But the moon was far away. The wisdom of complete knowledge was still farther away.

Liu Ching-chen read and reread the Buddhist secret books which Hsuan-tsang had brought from India. But Hsüan-tsang had not brought all the wisdom of Buddha.

To the west, beyond the high mountains, in distant India, stood the mysterious temple of Peals of Thunder, where books about the heavens, treatises about the earth, and sutras about evil demons were preserved.

So Liu Ching-chen turned his face to the west and set out for India on foot, knowing this would please the gods. He experienced thirst in the desert, fear in the forests, and hunger on the barren plains. He crossed high rocky mountains, where on stormy nights evil spirits sharpened their bronze swords against the rough boulders. Finally, after making his way across the last eight mountain passes and through the last nine ravines, Liu Ching-chen reached India. This was in the year of Metal and the Tiger.

Liu Ching-chen came to the Temple of Incarnation, where special cells were set aside for meditation. Here he was told of a Hindu sage living in the mountains who, through frugality, silence and immobility, had attained a state of mystical awareness that was the Third Degree of Holiness.

Liu Ching-chen set out for the terrifying mountains in search of the cave where this Indian sage sat contemplating his inner self, having renounced a world that was merely the semblance of reality.

The sage did not turn Liu Ching-chen away. He told him about the system of philosophy known as Sankhya, the eight aspects of the Unknown, the eight aspects of Delusion, and the eighteen aspects of Absolute Darkness. He taught Liu Ching-chen the Four Modes of Breathing and all else that gives man power over his own body. He taught Liu Ching-chen the science of the power of the spirit over the world around him.

Liu Ching-chen moved into a cave not far from the Indian sage. He did not disturb the sage; he did not see him in the flesh, but he communicated with him by the force of his spirit.

He learned to renounce all that was earthly. He was indifferent to the changing of the seasons, to inclement weather, to wind and snow.

One day, the sky grew dark. Hot air streamed down the mountain slopes, driving before it masses of snow that melted instantly. Frightful heat swept over Liu Ching-chen; he felt the mountain tremble beneath him. Then he saw one of the Five Beasts, the Unicorn, descend from the heavens.

The Unicorn was more than 300 *chi*, or 100 metres, long, and at least 80 *chi*, or 25 metres, around. Its body was covered with golden scales. It lay without moving. Then it expelled a breath, and the hissing of the air that came out of its nostrils was so loud and so terrifying that Liu Ching-chen could no longer bear to be alone. He fled to join his Hindu mentor. They huddled together, trembling with fear as they gazed at this sign from heaven, and they prayed to Buddha.

Then the jaws of the Unicorn opened and a man stepped out. Although he was more than seven *chi* tall and his naked body had a transparent covering through which gleamed copper-coloured skin, he was a two-legged creature with nine orifices, and therefore a human being.

The copper-coloured man looked round. He carried a weapon, a three-pronged spear, which he thrust into the rocks without leaving a scratch on them. Then six more like him stepped out from between the Unicorn's jaws. They strode along, plunging their three-pronged spears into the rocks, producing streaks of green lightning with which they splintered the rocks.

After a large number of rocks had been splintered into rubble the copper-coloured men drew

a scroll out of the Unicorn's mouth, unrolled it, and turned it into a path that ran of itself but remained in the same place. They tried to feed broken stone to the Unicorn, but every time they picked them up the stones fell through the palms of their hands like water through a sieve.

They collected switches of gold and silver, wove a cage out of them, and placed the cage on top of the pile of rubble. They drew red tendons from the body of the Unicorn and tied them to the cage. Liu Ching-chen and his companion heard the Unicorn give a long scream. They saw a radiance about the cage, and they sensed, in the air, the freshness that follows a thunderstorm.

The copper-skinned men could now pick up the stones, which they flung on the running path. The path carried the stones into the mouth of the Unicorn, and the Unicorn swallowed them. After this the men stepped into the mouth of the Unicorn, carrying away all the switches from the cage, and the Unicorn roared with pleasure as it swallowed the stones.

Finally the Unicorn belched up the stones it had not been able to digest. These were black and scorched from being in his belly, and the smoke they gave off was green. Together with the black stones the Unicorn threw up iron crowns that looked like flowers with many petals, after which its jaws snapped shut. The Unicorn rose on its tail, erupting fire, and soared upwards. It hovered over the mountain for a long time, resting on the fire.

Liu Ching-chen and his mentor fell flat on the ground, for the air round them was hot and heavy, and it scorched and oppressed them. When they dared to lift their heads the Unicorn was gone.

At the bottom of the ravine lay smoking stones, the remains of its meal.

The two men sat there for a long time in a state of silent meditation, attempting to comprehend what had taken place.

Then the Hindu sage rose and walked over to the stones. He bent down to pick up the remains of the Unicorn's meal, but his fingers passed through the stones. He was unable to hold them in his hands.

They meditated three more days. On the morning of the fourth day the Hindu sage said: "We are wrong to regard the world about us as Maya, the world of illusion. Take those stones. We could see them and we could feel them, but the celestial beings could only see them; they could not feel them. Yet they had knowledge. Applying their knowledge, they changed the essence of the stones so that they could feel them.

"Woe is me! How many years I have lost seeking knowledge in the wrong place! Man does have power over material things. Man smelts ore to obtain iron. He fells trees and makes resin. There is no Maya; there are only things and man's power over them."

The Hindu departed. But Liu Ching-chen did not lose faith. He wrote down what he had seen, and having thus freed his mind he resumed his meditation. He was now at peace again. But this peace was disturbed when the Hindu sage returned to the ravine.

The Hindu was richly outfitted and was accompanied by many servants. They placed a black wheel with golden discs before the Hindu and whirled it for a long time, like a prayer wheel, until sparks flew and the air took on a fresh smell.

Imitating the copper-coloured men, the Hindu placed a golden cage on top of the stones and the iron, the food of the Unicorn, and repeated what the copper-coloured men had done. The stones obeyed him, and he was able to pick them up.

"Liu Ching-chen," he called. "A nobleman has given me these servants and the food and the vessels. I shall live in his house and seek Power over Things. You were my disciple before; be my disciple now."

However, Liu Ching-chen refused to yield to temptation. He knew that the Hindu, the servants, the mountains and everything else were Maya, the world of illusion.

After the Hindu departed, carrying away the stones and the iron of the copper-coloured men, Liu Ching-chen remained in the mountains a long time. Then he went down to the valley, to the Temple of Incarnation. There the mantle of holiness descended on him. He now returned home to teach his fellow-men meekness and humility, inasmuch as the world of the senses is merely Maya, the seeming, non-existent world.

The Hindu, so it was rumoured, learned something mysterious when he entered into the affairs of earthly rulers and was therefore done away with. His soul went through a bad reincarnation, descending the Ladder of Perfection. Thus, too, will it be with all who attempt to give a materialistic interpretation to heavenly miracles and signs. Such an interpretation is an insult to the gods, for the world of things is merely Maya, illusion.

Academician Markov fell silent. He neatly folded the pages of the photographic reproduction and put them back into the folder. Then he removed his glasses and polished them with a handkerchief.

The afterglow of the setting sun slowly faded outside the window. A bird cried somewhere in the pine woods. The blue silence of twilight settled over the Moscow countryside.

The Academician's guests, spellbound by the story he had just read them, sat in silence. Professor Bagbanly was the first to speak.

"The Hindu in this story reminds me of the ancient sage in Fedor Matveyev's manuscript," he remarked, rising. He began to pace the floor. "To what century does your story relate?"

"The sixth, according to the European system of chronology. Not earlier. The hero read books which Hsuan-tsang brought from India, and Hsuan-tsang lived in the sixth century."

"But wasn't some kind of year mentioned in the tale?"

"Yes. Liu Ching-chen came to India in the year of Metal and the Tiger. According to the old Chinese system, that was the twenty-seventh year of a cycle. There were sixty years in a cycle. The first year of a cycle was the year of Wood and the Mouse."

"How does that fit in with our calendar?"

"Well, in the current cycle the year of Metal and the Tiger was 1951. If we go back sixty years from that we get 1891, then 1831, then 1771, then 1711—"

"The year 1711?" Privalov interrupted. "That tallies with Fedor Matveyev's manuscript. Liu Ching-chen could have come into contact with

the same Hindu sage who several years later gave Matveyev's knife the property of penetrability.

"Why can't we assume," he went on, "that a spaceship from some distant world was forced to land somewhere in the Himalayas? The ship came from a world where the bonds connecting matter are different. The spacemen had to replenish their supply of nuclear fuel. The rock they found in the Himalayas proved to be active enough for their needs. They split it by the electrospark method."

"Not the Lazarenko method, by any chance?" Professor Bagbanly asked joshingly.

"At any rate, they probably had a similar method: But a hitch arose: they found matter on earth to be penetrable. They then assembled some sort of apparatus and changed the properties of the stones, making them impenetrable, and loaded them into the spaceship on a belt conveyor. Next they repaired the ship, putting in some new gears and discarding the used ones—those were the 'iron flowers'—and flew off to wherever they were bound."

Professor Bagbanly laughed. "You'd make a good science-fiction writer, Boris."

Academician Markov was sketching the head of an old man with a beard and a hooked nose on his writing pad. He appeared to be completely absorbed in what he was doing, but suddenly he raised his head and looked at Professor Bagbanly. "Why not?" he said. "Anything's possible in this world. The wildest fantasies do not surprise science any longer."

"True enough. But a spaceship in the Himalayas—"

"The Hindu happened to be in the mountains," the Academician went on quietly. "He watched those creatures from outer space. He had probably dabbled in physics before this. Later he may have used the restructured stones as a force for passing on their properties to other objects."

Privalov sprang to his feet. "Passing on their properties to other objects? What an odd idea!"

"Not at all," the Academician insisted. "If we had something made out of a substance with changed bonds—for example, that legendary knife of Fedor Matveyev's—we'd immediately look for a way of transferring its properties."

Privalov seemed upset to hear this. "Do you mean we aren't on the right track? Does that mean the 'half-twist spiral' which Fedor Matveyev mentioned was not a Möbius band at all but something else?"

"No, we're on the right track, Boris. About that band of Matveyev's, it's hard to tell—It may have been simply a part of the apparatus. The important thing is that the word suggested a magnificent idea to your Nikolai Potapkin."

The Academician paused, then went on, "However, it's still merely an assumption. Only one thing is obvious. At the beginning of the eighteenth century India had a great scientist, a man whose name we do not know. He greatly enriched his age, but his own life was a tragedy."

Boris Privalov sat lost in thought. His mind was on Liu Ching-chen and the Hindu sage. In his imagination he saw the towering peaks of the Himalayas, and exhausted men bringing down some sort of resins from the mountains. Fedor Matveyev mentioned those resins, leading Kol-

tukhov to conceive the idea of powerfully charged electrets.

After a time he said: "What if we tried to fill in the power abyss with electrets?"

"With electrets?" The Academician looked at him in surprise. "But they're a very weak source, even though, I admit, inexhaustible."

"Weak, you say? But listen to this!" Privalov retold the episode described in Fedor Matveyev's manuscript and then spoke of Koltukhov's supposition that Lal Chandra's men had charged the resin with cosmic rays.

"Yes, now I remember," said the Academician. "But it never entered my head— Well, well, do go on."

Privalov excitedly gave a detailed account of Koltukhov's experiments with electret coatings for pipelines.

"By Allah, that's not a bad idea at all!" Professor Bagbanly exclaimed when Privalov had finished. "The Academy has the most powerful electrostatic generators in the world. Let's use them to charge resin according to Koltukhov's method."

"A powerful, inexhaustible battery of electrets," Academician Markov murmured thoughtfully. "Very well, let's try it." He paused, then said, "The frequency situation is clear. Now we'll tackle the power situation. Let's build a model of your pipeless oil pipeline, but in a small pool and without glass tubes."

"Like Lal Chandra's?" Privalov asked.

"Something like it. But without any theatrical effects such as burning water. Lal Chandra must have broken down the water in the pool by electrolysis and ignited the hydrogen with a spark.

That's no use to us, of course. But pumping oil through water is something we want to do. We'll set up a Möbius band in the pool, both a reception band and a transmission band. Also a power beam installation. We'll test the electrets.

"We'll try to drive a stream of oil through water. We'll see how the restructured matter behaves within the framework of intensified surface tension. If we get results that look promising we'll try to shift our experiment to your place on the Caspian. We'll choose a suitable area of the sea and do the experiment under natural conditions. By the way, I must go down to the Caspian for something else besides this pipeline business. There's another problem that is just as important."

CHAPTER FOUR

IN WHICH THE CREW OF THE *MEKONG* LEARNS TO LIVE ON A DESERT ISLAND

Kneeling behind Yura's head, Nikolai energetically brought Yura's arms up over his head and then back to his sides. He worked steadily, up and down, up and down. Val stood beside him. She was shaking all over. Suddenly Yura gave a faint groan. Sobbing, Val fell to her knees beside him.

"Go away!" Nikolai shouted angrily, moving Yura's arms up and down more vigorously than ever. Yura's body jerked. He opened his eyes, sighed, then turned his head and vomited.

Meanwhile, the storm continued to rage. The wind howled savagely and the surf thundered as it crashed against the rocks. Sand began to fill

the hollow. It grated between their teeth and sifted into their ears.

"He'll live," said Nikolai as he threw himself onto the sand in utter exhaustion.

"My head aches," Yura muttered, looking up at the dark figures around him. "One, two, three—" he counted. "Where's Rex? Ah, there he is." He closed his eyes.

Val held his hand tightly in hers.

"I hit my head on a bitt when the stay-sheet swung past me," he whispered a little later.

"Nikolai pulled you out of the water," said Val. Big tears were rolling down her cheeks. Yura muttered something that sounded like "He did the right thing".

When it started to grow light the crew of the *Mekong* climbed the slope. Below they saw a strip of beach. Stiff tufts of tall brown grass thrust up out of the sand. The *Mekong* lay on its side on a reef. Without its mast it looked headless. Waves were washing over it. The sea, an angry dark grey, was covered with whitecaps.

"Let's take a look at the boat," said Nikolai, running down to the beach.

Yura was about to follow but stopped when Nikolai turned round and shouted: "Stay where you are! Valery and I will go."

The two young men slowly waded along the reef, pushing their way through the cold, heavy waves. Large chunks of sandstone were scattered over the bottom.

The boat's rudder was firmly wedged between two submerged rocks. The broken mast, still attached to the deck, was being pounded by the waves against the side of the boat.

Nikolai and Valery scrambled up onto the

deck and made their way to the cabin, which was half full of water and in a complete mess. The portholes had been smashed in; a lady's slipper, several ring-shaped bread rolls and a bunch of onions floated on the water. On the starboard side there was a hole four planks wide below the waterline. Nikolai discovered this when he put his foot through it.

"Looks like we're stuck on this island," he muttered.

He dived, ran his hands round the corner of the cabin that was under the water, and brought up a canvas sack of tools.

"Now I feel better," he told Valery, snorting and blowing out water.

"Here's the fishing gear!" Valery shouted joyfully. During the night he had been silent and a bit frightened. Now he was his old self again. "We'll catch fish and live like Robinson Crusoe."

They dragged up to the deck everything the water had not swept away through the hole. Then they fashioned a small raft out of boards, loaded what they had salvaged onto it, lashed the things all down securely with ropes, and dragged the raft to shore. Immediately afterwards, they made a second trip, returning bowed down under the weight of the wet sails. Also, they dragged the mast to the beach.

When they had rested up a bit they spread the sails out to dry, placing rocks on the corners to prevent them from being carried away by the wind. They likewise spread out the salvaged food and clothing on the pebbles to dry.

The high wind drove low, ragged clouds over the little island and sent huge waves sweeping across the reef. The five young people and the

dog were stranded on an inhospitable patch of land.

Setting her bare feet down gingerly on the pebbles, Rita walked over to Nikolai.

"What are we going to do, Commodore?" she asked.

"We're going to have some breakfast first, and then we'll see."

They went back to the hollow, where they were sheltered against the wind. Yura opened three tins of meat with his knife.

"Couldn't we heat them up?" Val asked.

"Certainly. If we had kerosene and matches."

"No matches at all? How will we get along without fire?"

"Oh, we'll have fire," Yura promised. "After all, this isn't the Stone Age."

They ate in silence, using two knives, two screwdrivers and Yura's trusty Durandal screwdriver.

Nikolai reviewed their situation. "The boat's smashed," he said, "so we'll have to forget about any further sailing for the time being. We'll have to live on this island for a while. Fishing vessels and ships of the Caspian oil prospecting service sail among these islands all the time, so we needn't worry about not being rescued. We'll keep a signal fire burning all night long."

"Let's take stock of our food," Yura suggested. "Any self-respecting Robinson Crusoe always starts with that."

The castaways found they had nine tins of meat, four tins of sardines and a tin of hardtack. They also had three packets of dehydrated pea soup that were splitting open, twenty-seven potatoes, six packages of soggy biscuits, a bundle

of onions, and two bottles of vegetable oil. Their supplies of flour, sugar, millet grits and butter had vanished for good.

"What about water?" Rita asked.

"I think there's enough." Nikolai indicated a wooden cask. "There must be thirty litres here. It'll last us a good ten days. Then we can use this resin to turn sea water into at least twenty litres of drinking water. But we don't have enough food."

"We'll catch fish," said Valery.

"Yes, of course. Fish will be our mainstay. We'll save the tinned meat for an emergency. I'm sure we'll manage."

The other items salvaged were: Rita's sundress, one sandal of Val's (the right foot) and one sandal of Valery's (the left foot), the blankets, the primus stove, the transistor radio, the aqualung, the camera, the fishing rod, the binoculars and the compass. Printed matter included sailing directions, Kaverin's novel *Fulfillment of Desire*, whose pages the wind was indifferently ruffling, and a map, now spread out to dry on the beach and held down by stones along the edges.

A mess-tin, a saucepan and a canvas pail were the only vessels they now had. In the tool case they found, besides the two knives and the two screwdrivers, a hatchet, pliers, a chisel, a hacksaw, nails, a tin containing sail thread and needles, and a tin of polish with which to keep the brass on the boat bright. The label said the polish could be used to clean jewels, dentures, lavatory pans, samovars, wind instruments and trolleybuses.

"The funny thing is that it's all true," said

Nikolai, turning the tin about in his hands. "What a pity we don't have any trolleybuses or precious stones!"

They all wore watches, but only Rita's and Valery's still kept time. Nikolai's watch ticked only when he shook it, while Yura's waterproof and shockproof model did not react to shaking or to anything else.

"Well, the warranty that came with my watch said the wearer should guard it against shock and water," Yura remarked.

He was studying the map, running his finger over the still damp surface.

"Where are we?" Nikolai asked, squatting on his haunches beside Yura.

"This must be Ipaty Island," Yura said. "We were driven southwards and the gale struck right here. Yes, Ipaty Island." He leafed through the sailing directions. "The island emerged from the sea about a century and a half ago. Before that there was a shoal here known as Devil's Site."

Towards noon the wind died down and it grew warmer. The castaways set about building themselves a shelter. They placed the mast on the ground in such a way that it jutted all of three metres over the hollow. Next, they heaped stones on the end of the mast to make it secure, and supported the jutting end with crossed boathooks. They draped the spinnaker over this frame and tied the edges to stakes driven into the ground. The storm sail was arranged to curtain off part of the tent for the ladies. They turned the folded mainsail into a springy floor and the jib into a door.

Yura clicked his tongue. "A tiptop wigwam.

I've dreamed of living in a cosy wigwam like this since I was a kid."

"Our next job," said Nikolai, "is fire. The sky seems to be clearing up a bit. As soon as the sun comes out we'll make fire. Meanwhile, let's get some firewood."

"You sound as though someone had laid in a supply of firewood especially for us," Val remarked sarcastically.

"That's exactly what the sea has done. North of us lies a densely-populated coast. The north wind is the prevailing wind here. And to top it all, our camp is situated on the north side of this island. So there must be firewood somewhere close by."

Valery was told to find a calm cove and try his luck with the fishing-rod. The others wandered off along the shore.

"Here's the first piece of wood!" Nikolai exclaimed, picking up an old, cracked slat from a dinghy. After that they found boards from crates and pieces of square beams and fishing-net frames.

When, loaded with firewood, they returned to the camp, a patch of blue was visible through the clouds. The sun peeped out timidly but immediately dived back into a cloud.

Valery had caught a few little bullheads and one good-sized carp, which he handed over to the girls to clean. The cloud slid away from the sun. Yura unscrewed the lens of the camera and used it as a magnifying glass to set fire to several strands of rope. After energetic blowing, a few chips of wood caught fire. It was not long before a fire was blazing merrily in the hollow.

"We'll never have to worry as long as you boys are here," Val remarked, smiling.

The men sharpened the knives on a flat stone and carved, out of driftwood, five objects more or less resembling spoons.

They set to dinner with a healthy appetite.

"I never tasted a better fish stew in my life," Rita confessed. "I'm ashamed of myself but I can't seem to stop eating—"

After lunch they grew drowsy, for none of them had slept much the previous night.

"Crawl into the wigwam and take a nap," Nikolai said. "I'll stand watch for a while."

He sat alone for a long time, tossing pieces of driftwood on the fire. Rex dozed by his side. He was glad the girls showed no signs of being worried but were content to leave everything to Yura and himself. But, facing the facts squarely, he had to admit it was unlikely that they would be rescued. They could not bank on anyone calling at the island. He'd have to think of a way out—

In the primeval silence the surf pounded with a sullen roar. The sky had cleared in the west, and it now glowed red and gold from the setting sun.

He'd have to think of a way out—

He dozed off, but before long a rustling sound caused him to jerk up his head. Rita had emerged from the tent. She yawned and sat down beside him.

"Are we going to be here long, Nikolai?" she asked, picking up a handful of sand and letting it run through her fingers. "It's important for me to know."

"I'm afraid I can't tell you. We'll think of

a way out. Are you sorry you came along?"

"No, not a bit. But I'd like to return to town as soon as possible."

"We'll think of a way out," he repeated. "There's no such thing as a hopeless situation."

Rita smiled at him. "Be sure to find a way out," she said softly.

That evening they sang songs in chorus. They were in high spirits as they learned the words of a Papuan song that Nikolai had found in a book by the explorer Miklukho-Maklay. The rather repetitious Papuan song, which fitted in with their present situation, spoke of how to make the pith of the sago palm edible. Yura conducted, while the others danced round the fire, hands linked, and sang:

Bom, bom, marare;
Marare, tamole.
Mara, mara, marare,
Bom, bom, marare.

Rex howled conscientiously, his muzzle pointed skywards.

When they finished singing they decided in what order they would stand night watches of two hours each. The man on duty would keep a fire going on top of the hillock as a signal to any ship that might pass by.

Yura was the first to go on duty. Val sat beside him. Reflections of the fire flickered across their faces.

"Does your head ache badly?" Val asked.

"No, it's much better."

"Just think of it—if it hadn't been for Nikolai—" She did not finish the sentence but moved closer to him. He put his arm round her shoul-

ders and said in a voice she did not recognize, "Know what, Val? Let's get married."

He did not see Val's face light up because just then the fire gave off a shower of sparks and he leaned forward to toss on a piece of wood.

Val laughed softly. "First we'll have to get off this island—"

"Well, what do you say?"

Val kissed him quickly and rose to her feet. "Good night, Yura," she whispered, and crawled into the tent, smiling happily in the darkness.

The morning dawned on a blue sea without a single ripple. Wispy white clouds floated in the sky.

Yura and Nikolai waded along the reef until they reached the *Mekong*. A careful examination convinced them that they would not be able to patch up the hole or get the boat off the reef. Two pontoons and a launch would be needed to tow their sailboat back to the marina.

On their return to shore Nikolai slowly swept the horizon with his binoculars. Then he handed them to Yura. "Look over there."

What Yura saw through the glasses was a lacy network of lines in the sky that looked as though they had been drawn in India ink on blue silk. This was the top of an oil rig.

Yura ran into the tent for the map and compass. He studied the map carefully and then declared that what they saw was an offshore exploratory rig near Turtle Island.

"Yes, that confirms it," he said. "We're on Ipaty. Turtle Island is about fifteen nautical miles from here. The rig can be our reference point. Shall we try to swim there?"

"No, it's too far. Besides, the current will be against us. What we must do is build a raft."

"A raft?"

"That's right. With a sail and a sliding rudder. Like the *Kon-Tiki*. We'll choose a day with a south wind—with a north wind we wouldn't make it on a raft—and it shouldn't take us more than eight hours to reach Turtle Island. If we find geologists there they'll have a transmitter. We'll radio to town and Mehti will send a motorboat for us."

"Suppose there aren't any geologists working there?"

"Then we'll continue on to the next island. We'll go island-hopping."

"So be it. We'll start building a raft at once."

After breakfast the castaways set out to explore their new domain and to search for building material for a raft.

The north shore of the island was strewn with driftwood. There were also logs that storms had torn loose from timber rafts, with staples sticking out of them. They selected logs they could use for the raft and rolled them higher up on shore.

Some five hundred metres farther on the sloping shore turned southwards and grew steeper. There the water was a bluish-grey. Large gas bubbles seethed in it and burst on reaching the surface.

"Another volcano!" Yura exclaimed.

"And here's his land brother," said Nikolai. Ten metres from the water's edge there was a little mound topped by a small crater from which warm, watery mud was slowly flowing down to the sea.

Nikolai climbed to the top of the crater, pulled

off his shirt, spread it out on the ground, and heaped thick grey clay from the crater on it.

"What's that for, Nikolai?" Valery asked.

"A stove."

"But you'll ruin your shirt," said Rita.

"Quite the contrary. This clay is a fine cleansing agent."

The south shore proved to be steep. It was edged with a narrow strip of pebbles and boulders, and there was no sand.

"An easy place to approach from the sea," Nikolai remarked when they came to a cove. "Look, the water here is deep very close to the shore; you could come close in a boat."

"That's just what somebody has been doing," said Valery, pointing to a piece of pipe half buried in the pebbles on the beach. It had obviously been used as a bollard.

The young engineers examined the pipe. They discovered the trade-mark of the Southern Pipe Mill and also a series of numbers indicating the size of the pipe, the number of the melt, the grade of steel, and the year it was made.

"Why, it's last year's date!" Yura exclaimed.

"That means geologists come here." Nikolai looked at Rita. "I told you we wouldn't be stuck here."

The tour of the island did not take long. The total length of the shoreline could not have been more than three kilometers.

"Now, my friends, let's get to work," said Nikolai after they returned to camp. "Valery, cast your fishing-line again. Yura and I will drag some logs."

With the help from the girls Yura and Nikolai rolled the logs on the north side of the island down to the water, roped them together, and

pulled them round to the camp. On the way Nikolai picked up a stump that was half rotten and covered with a thick coating of salt.

"What are you going to do with that horrid thing?" Val asked.

"You'll see."

After a dip in the sea Yura and Nikolai built a stove out of chunks of sandstone and coated it with volcanic clay.

"Campfires may be more romantic but they don't produce much heat and they eat up a lot of wood," said Yura. "We're not savages, after all."

Valery returned with his catch, followed by Rex, rapturously sniffing at the fishtails trailing over the pebbles.

Meanwhile, Nikolai set fire to the rotten stump. When it had burned away he collected the ashes in a tin, tasted them, nodded with satisfaction, and dropped a pinch into the pot in which the fish were cooking.

"What are you doing?" Val exclaimed in horror. "Are you mad?"

Nikolai held the tin out to her. "You try it."

"Not for the world!"

Rita stuck a dampened finger into the tin and licked it.

"Why, it's salt!" she exclaimed.

"Miklukho-Maklay is helping us again," Nikolai explained. "He wrote that the tribes of New Guinea eat the ashes of a tree that has lain in salt water for a long time."

Rita laughed. "I've read Miklukho-Maklay too but I don't remember that. There certainly is nothing to worry about when you boys are around."

After lunch they boiled some water and ratio-

ned it out. Although water was poured into a tin for Rex as usual, he refused to drink it. Instead, he stretched out in the shade of the tent and placed his tongue on his front paws.

Yura and Nikolai exchanged glances.

"What's wrong with him?" Yura asked. "He hasn't touched water since morning."

"Could he be going mad?" Val suggested worriedly.

Rita called to Rex, took his head between her hands, looked closely at his eyes and nose, then opened his jaws and examined them.

"I've never seen a healthier dog in my life," she said, pushing Rex's nose into the tin of water. "Please drink, Rex."

But Rex squirmed out of her grip and ran off.

"I don't like that," said Yura. "I wonder where he's off to. I intend to find out."

He set off after the dog, in the direction of the middle of the island. The others followed. At the top of the rise they saw another mud volcano, at the foot of which grew tufts of brown grass. Nearby, between two parallel slopes, there lay several pools of water. Rex was wandering from pool to pool.

"There's the answer," said Yura. "The water from the cask isn't fresh—and he must have found fresh water here this morning. Fine explorers we are! We investigated the edge of the island but didn't think of going into the middle. Rex did our thinking for us."

Skirting the mud volcano, they reached a rise beyond which they could see the blue water of the cove where they had found the mooring pipe. From above they saw a reinforced concrete dome

rising out of the grey clayey soil. Beside it protruded a concrete ventilation pipe covered with an iron grating. On the other side of the dome a pipe covered with a flaky film of oxide jutted out of the ground.

Nikolai ran his hands over the rough surface of the pipe. "Looks like the exhaust pipe of an engine," he said.

On the slope there was a depression that led to a massive steel door. A large lock wrapped in a piece of oily cloth hung on the door. A lead seal dangled from the lock.

"I should certainly like to know what it all means," Yura remarked at sight of the seal.

"Look!" Rita exclaimed. "What's the matter with Rex?"

The dog was sniffing the sand near the door and whining. Then he ran to one side and started digging into the pebbles.

"This looks like an old pillbox," Nikolai said thoughtfully. "There may have been an anti-aircraft gun here during the war. Now the pillbox is being used for something else. Perhaps a storehouse."

"Let's forget about it," said Yura. "This must be something very hush-hush. It's no business of ours."

"What's that dog growling about? Rex, come here," Rita called. "Take it easy, old boy. We're going home now."

A week passed. A cloudless sky stretched above Ipaty Island. The sea, alas, was deserted. Neither a wisp of smoke nor a glimpse of a sail appeared on the horizon.

Making a raft out of different-sized logs was a slow process for the inexperienced builders. After much effort and many arguments the logs were selected and neatly tied together. The sliding keel, made out of pieces of board, required just as much effort.

The spanker boom from the boat, fastened down with shrouds and a stay, was the mast. A steering oar made of two long poles and the seat of a chair, all gifts of the sea, were attached to the stern.

All day long an axe tapped, a hack-saw whined, and songs rang out on the reef where work was in progress on the raft.

The fish were biting well. Just in case, the girls strung the fish on cords and hung it up to dry in the sun and the wind, the oldest way there is of curing fish.

It was not long, though, before all of them were sick and tired of their fish diet.

"But it's good for you," Rita scolded when she saw Yura toss a half-eaten piece over his shoulder. "Fish has lots of phosphorus; it's the best brain food."

"There's nothing I'd like better right now than some sausage," Yura said with a sigh.

Rex was also tired of fish. He ran about the island hunting lizards and water snakes, partly for the fun of it. Sometimes he sniffed about the reinforced concrete dome and threw up pebbles with his paws—always at one and the same spot. Nikolai and Yura were intrigued by the dog's odd behaviour. They deepened the hole Rex had dug, and about a metre below the surface of the clayey soil they found the body of a dog. Yura gave a whistle. "This dog was dissected!" he exclaimed.

"A desert island and experiments on dogs!" Nikolai said. "I'd certainly like to know what's going on here."

Widening the hole, they found that several other dogs had been buried there. Rex alternately growled and whined piteously, pressing close to Yura's leg. They filled in the hole and stamped on the earth when they had finished.

When Nikolai returned to camp and told the others about their queer find a shadow fell across Rita's face.

"Experiments on dogs?" she repeated.

She said nothing more for the rest of the day. In the evening, alone with Nikolai beside the signal campfire, she said, "I can't stand it any longer. I simply *must* return to town."

"The raft's ready," said Nikolai. "As soon as we get a south wind—"

"Suppose we don't for another week?"

Nikolai did not reply. What could he say? There had been a dead calm for days. Even the flames in the campfire hardly flickered at all.

In the red glow from the fire Nikolai looked remote and estranged. Rita turned her head to glance about forlornly at the night; the familiar pounding of the surf rang in her ears.

"He also experimented on dogs," she said in a low voice.

"He did?" Nikolai looked at Rita, then turned his eyes away. An odd thought had occurred to him. What if—

Rita was thinking the same thing. Anatole often went away to some sort of secret laboratory for long periods of time. He had never told Rita where the laboratory was.

"You made me promise, Rita, so I'm not saying anything. But we're not doing the right thing. The whole matter should be brought out into the open. Those two ought to be drawn into our joint project. Or, at least, Anatole—"

Rita remained silent. Finally she said: "I think he'll realize that himself. Anyway, I can't stay here any longer. You promised to think of a way out. Well, keep your promise."

Nikolai was on the point of saying that he couldn't conjure up a south wind, but he refrained.

Towards the end of the eleventh day, after supper, when it had grown somewhat cooler, Val suddenly burst into laughter.

"What a sight you are!" she said, running her eyes over the three young men. "You're unshaven and dirty-faced. You look like savages." She put her hand out to touch Yura's soft reddish beard. He jerked his head away and clicked his teeth. She drew back her hand. "You really have turned into a savage," she said.

"You know, Val, you and I don't look any better," Rita remarked, her glance falling on her scratched and bruised arms and her broken fingernails.

"You're right," Val agreed mournfully. "How grand it would be to wash my hair in fresh, hot water and to put on a little perfume—"

"You know what? Let's drive the men away tomorrow and heat up some water. We'll have a glorious bath."

"You're wonderful, Rita!" Val cried. "And let's do the laundry too."

This conversation took place on the eve of their twelfth day on Ipaty Island, a day of important events.

Next morning Nikolai, Yura and Valery brought armfuls of seaweed to the campfire and burned it for ashes. They carried fresh water from the pools near the mud volcanoes and filled all the vessels. Then they departed. Rita and Val scrubbed the clothes, using ashes and volcanic clay for soap, and had a good wash themselves.

Meanwhile, the three young men went swimming off the southern tip of the island, diving and fishing with their spear gun. Afterwards they stretched out to rest on the beach of the cove. Rex went up the slope in pursuit of a lizard.

"I swam to the other side of that headland," said Nikolai. "The water there is agitated; there must be a strong discharge of gas at that particular spot."

"Yes, we're living on top of a volcano," Yura stated. He was lying on his back, his face covered with his faded red kerchief. "How hot it is today! Feels like there's going to be a change in the weather."

They lay motionless, exhausted by the heat and their long stay in the water. Suddenly they heard a faint sound in the dead silence of high noon.

Nikolai sat up and cocked his head. "What's that? An engine?"

The sound was repeated a moment later and then stopped short.

Nikolai scooped up the binoculars and ran to the top of the slope. Yura and Valery followed close behind him.

A boat was coming towards the island from the west. Although it was still far away they could make out three figures in it. One of them was steadily bending forward and then backward.

"It sounded like a motorboat. Why should they be rowing?"

"Let's have a look." Yura took the binoculars from Nikolai. "They're coming this way. And I'll be damned if that isn't Uncle Vova Bugrov at the oars!"

Nikolai snatched the binoculars away from him.

Yes, it was Bugrov. He sat with his back to the shore, but he turned to look at the island two or three times and Nikolai recognized him. Bugrov was propelling the motorboat towards the island with strong strokes of his oars. Now Nikolai could make out the two passengers. One of them was Opratin. He sat in the stern, in a short-sleeved green shirt and a straw hat. The third person, a thickset, shaggy man, sat hunched over in the bow. Nikolai could see only his back, across which a white shirt stretched tight, but he immediately knew the man was Anatole.

"How do you like that?" Nikolai asked, handing the binoculars to Yura again.

"They've certainly chosen a secluded spot for their experiments," said Yura. "Shall we let them know we're here?"

Nikolai did not answer at once. "Should I tell Rita?" he wondered. From their hollow on the north-eastern shore the girls would not see a boat approaching from the west. Best not to hurry. He and Yura and Valery would watch a while longer.

"Wait a bit," he said. "Let's see what they're up to."

Yura nodded. "Right you are. There must be some important reason why they've hidden themselves away on this island. Let's go over to the

big crater. The grass is high there and we'll have a good view."

They whistled for Rex to come back to them and then stretched out on the slope of the crater. The sun blazed down on their backs; the stiff, prickly grass scratched their bare skin. But they had a perfect observation post. The cove lay spread out below them.

The nose of the boat touched the shore. Bugrov sprang out into the deep water and tied the painter to a ring on the mooring post.

Next, Opratin and Anatole stepped out of the boat. Anatole at once started up the slope, panting and halting at frequent intervals to catch his breath. Opratin remained behind to talk with Bugrov.

"Good thing we were close to the island when the engine died on us," they heard Bugrov say in his booming voice. "I'll have to check the ignition."

Opratin said something and then turned away to follow Anatole in the direction of the reinforced concrete dome. They vanished from view when they descended into the hollow in front of the pillbox door. The bolt clanked, then the massive door creaked and slammed shut.

Bugrov got down to work on the beach. He took the ignition distributor out of the engine and laid it on a piece of canvas spread on the ground.

Yura, Nikolai and Valery continued to lie in hiding for some time, watching him work.

"I'm fed up with this cat-and-mouse stuff," Yura finally whispered. "We ought to come out into the open and let them know we're here."

"Wait a bit," Nikolai insisted.

"Then let's move into the shade. My brains are sizzling."

Bending low, they noiselessly skirted the mud volčano and came into the shade near the concrete outlet of the ventilation shaft. The heat was less oppressive here. Cool air from the underground chamber was wafted to them through the dark grating covering the shaft. They could hear a faint rustling.

Suddenly Anatole's voice came to them—so clearly that they gave a start and involuntarily bent lower.

"You'll have to get along without me," Anatole was saying. "I'll do what I have to do."

"Contact Bagbanly? Privalov?" Opratin's voice was so muffled they could barely make it out. They leaned closer to the grating, their bodies tense.

"Yes, I will. I'll give them the material and we'll all work together."

Opratin's voice was calm. "You have no right to do that without my consent."

"Do you have the right to use the Institute laboratory, which isn't yours, and to buy expensive equipment for this project on the Institute's money?"

There was a short pause.

"So that's how you view the matter," said Opratin. "Very nice of you. Why have you considered it possible to work here up until now? Why this crisis of conscience all of a sudden?"

Anatole muttered something and gave a cough.

"The result is what counts," Opratin went on. "No one's going to blame us after we announce a major breakthrough. Winners are never blamed."

"We haven't anything to announce. There isn't any breakthrough."

"Yes there is. Penetrability is in our hands."

"It's like a grenade in the hands of a child. No stability. We don't know the essence of the phenomenon."

"In another month or two we'll achieve stability."

"You're deceiving yourself!" Anatole shouted.

Rex growled softly in reply and received a slap from Nikolai. Fortunately, the men below had not heard the dog.

"We've reached an impasse," said Anatole. "We're not making any headway. We must climb out of this damned cellar and write to the Academy of Sciences. I realized that long ago, but I was just being obstinate—"

"You have no right to do that," Opratin said in a harsh voice. "We did the work together."

"Very well. I won't say anything about the circuit you developed. You can choke on it for all I care. But the idea of the 'transmission effect' is mine. I'm taking the knife and I'll write up a paper on my own work."

Yura's eyes were round as he nudged Nikolai with his elbow. The knife!

"You forget, my dear man, that I was the one who obtained the knife," Opratin remarked coldly.

"She gave you the knife only because of me, and not because she was smitten with you. Ah, if only I had listened to her! Oh well— But why are you being so stubborn?" Anatole asked after a pause. "We've done an enormous amount of work. Let's declare honestly that we can't go

any farther without help. Fame and honours won't slip through our fingers—"

"That's enough!" Opratin shouted. "I'm sick and tired of fussing over you. You're nothing but a miserable dope addict!"

"But who made me an addict? You're a scoundrel, that's what you are! Who procured the drugs for me? You did—because you wanted to hold me in the palm of your hand. But I'm not a finished man yet. I'll go into hospital and— And you can go to the devil! You may take 'The Key to the Mystery' with you for all I care!"

"Get out of here! We're returning to town at once."

"I should say not. I'm going to finish my latest experiment. I'll go down below now, rest a while where it's cool, and then—"

The voices fell silent. The two men must have moved to a different room.

"Did you hear that?" Yura whispered eagerly. "They have Fedor Matveyev's knife and 'The Key to the Mystery'. We were right. They were the ones who stole 'The Key to the Mystery' from the Moscow museum."

"Keep quiet!"

They waited, listening intently.

"Look here, Nikolai. We must come out into the open. There's something very fishy about the whole thing."

"It doesn't smell fishy to me. It smells of ozone."

"Ozone?" Yura sniffed. The air coming up through the ventilation shaft had a fresh smell as if before a thunderstorm. "High voltage—" he muttered.

The door on the other side of the pillbox squeaked as it was opened and then slammed shut.

Bending low, Nikolai ran to the mud volcano, with Yura and Valery behind him. They returned to their first hiding place.

They saw Opratin descend the slope to the beach, carrying a black attaché case. He walked over to where Bugrov was working.

"Why all of a sudden?" they heard Bugrov growl. "We were going to stay three days."

Opratin said something that they could not hear.

"Is he staying behind?" Bugrov asked.

"Yes."

"Wait a bit, until I put the engine together again."

"Be quick about it." Opratin began to stride nervously up and down the beach.

"What are we going to do, Nikolai?" Yura whispered. "Are we going to wait till they return for Anatole?"

"The devil only knows when they'll come back. We can't wait."

"Then let's go down to them now. At least one of us could return to town with them."

"I don't want Opratin to know we're here," said Nikolai. "He'll get the wind up if he sees us here and he'll play some dirty trick on Anatole."

"But why couldn't Valery go down to them and say he was shipwrecked? Opratin doesn't know Valery."

"No, we'll do it differently. He'll never suspect anything."

Yura stared at his friend, blinking in puzzlement.

"Valery, be a pal and run down to the camp for the scuba gear," said Nikolai. "Bring some

vegetable oil too. We'll be waiting for you over there."

"What are you planning?" Yura asked. "Are you going to—"

Nikolai nodded. "Yes, I'll hide underneath the boat and—"

"You're mad!"

"Run along, Valery, and be quick about it. Not a word to the girls, mind you!"

Valery gulped in bewilderment. "No, of course not." He raced round the mud volcano, clambered down the slope to the east shore and ran towards the camp.

"Don't be an idiot," Yura hissed. "It's fifty miles to town."

"I know that," Nikolai replied calmly. "The cylinders are practically full. I'll tie myself under the bow of the boat and breathe through the snorkel."

"You'll freeze before you're halfway there."

"I'll cover my body with vegetable oil."

Yura raised himself on his elbow. "I won't let you do it. I'll tackle Opratin. To hell with him—"

Nikolai pushed him down hard. "Don't worry about me," he said. "I'll be all right. After we leave, you go in to Anatole and talk to him. Tell him Rita is here. I'll get Mehti to send a launch for you this evening. Or tomorrow morning, at the latest. Okay?"

Yura knew it was useless to argue.

They crawled over to the opposite slope of the big crater, from which streams of warm mud were flowing, and descended to the beach on the east coast.

Valery came running up. Nikolai took the bottle, poured some of the oil into the palm of

his hand, and began to rub it into his skin. His body soon became shiny and slippery. He looked at the pressure gauge on the aqualung and found that it stood at 140 atmospheres, which meant it was almost full. Yura helped him to strap the cylinders to his back.

"Well, here we go." Nikolai squeezed Yura's hand, then shook hands with Valery. "See you soon, boys."

"Be careful, Nicky." Yura could say nothing more. He looked miserable. Nikolai clapped him on the shoulder and grinned.

He moistened the mask in the sea and clamped his teeth on the mouthpiece. From the mouthpiece two goffered hoses led to the cylinders, while a snorkel for ordinary breathing led upwards. Nikolai put on the mask, which covered his nose and eyes. He tied a length of rope around his waist, walked awkwardly down to the edge of the beach in his flippers, and entered the water.

When he had waded in up to his chin he switched on the cylinders, dived straight down and then swam along the shell-strewn bottom.

He rounded the steep headland and entered the cove. Using his air supply sparingly, he slowly swam along the shore until he saw the dark bottom of the motorboat. He swam under the boat, cautiously running his hand along the slimy bottom. At the bow his fingers encountered the lifeline hanging from the starboard side.

The motorboat rocked and settled deeply in the stern. The two men had evidently climbed in.

"If only they don't notice the bubbles," Nikolai thought as he took a firm grip on the life line.

CHAPTER FIVE

IN WHICH IMPORTANT EVENTS TAKE PLACE ON IPATY ISLAND

Yura and Valery stood on the shore, silently watching the air bubbles that marked Nikolai's movement under water.

The silence of the cove was broken by the roar of the outboard motor.

Yura gave a start, then turned and began to climb up the slope. Pebbles rattled under his bare feet and sand trickled down.

From the slope of the big mud volcano Yura and Valery watched the motorboat leave the cove and disappear round the headland. When it came into sight again the motor was droning steadily. Its bow rising into the air, the boat rapidly moved away from the island.

Through the binoculars Yura saw Bugrov and Opratin, both in the stern. A head in a mask jutted out of the water at the bow.

"He's sitting pretty," Yura muttered.

"Boys! Where are you?" came Val's voice from the middle of the island. Val and Rita appeared on the crest of the next slope. Yura rose and waved to them. The girls climbed up the side of the mud volcano.

"We heard a noise," said Rita, breathing hard. "It sounded like a motorboat."

Valery pointed towards the motorboat, now a dark streak against the blue water.

"A boat?" Val asked in astonishment. "Is it coming in?"

"No, it's going out."

"Why didn't you signal?"

"Where's Nikolai?" Rita asked.

"I'll tell you all about it." Yura gave them a brief run-down of the day's events on the island.

"You say Anatole's in there?" Rita sprang to her feet and raced to the concrete dome. She jumped down into the depression in front of the entrance to the pill-box, then paused to catch her breath. Her face was pale through the sun-tan.

A lock with a lead seal dangling from it hung on the steel door.

The others came running up.

"It's locked," Valery said. "How could that be?"

"Anatole must have changed his mind and left with the others," said Yura. "Actually, we didn't see them getting into the boat."

"No, we didn't see them getting in but—"

Yura interrupted him. "He was probably lying in the bottom of the boat resting."

"But what if Opratin locked him in?" Rita pounded on the steel door with her fists.

"Don't start inventing things," Yura said sternly. "They quarrelled, I know, but to lock him in— That's nonsense."

"How did you ever manage to overhear their conversation?"

Yura gestured with his head. "We were on the other side."

They skirted the dome and came up to the ventilation shaft.

"Anatole!" Rita shouted through the grating into the black maw of the shaft. "Anatole!"

The hollow echo was followed by silence.

"He went away, I tell you," Yura insisted. Meanwhile, his brain was working feverishly. "He could have come out later than the others—while we were outfitting Nikolai on the beach,"

he thought. "We didn't see him in the boat, but he might have been lying in the bottom for all we know."

"I simply must get inside, Yura."

"You mustn't break the seal."

"I won't have any peace of mind until I see for myself." Rita's dark eyes were filled with fear. Yura looked away. He put his hand on the rusty ventilation grating.

"Oh, to hell with it!" he exclaimed after a pause. He looked round. His eyes fell on an old, broken oar. He picked it up and thrust it between the rods of the grating. After pushing the oar up and down a few times he heard the grating creak and give. Valery helped him to pull one end of the loosened rods out of the concrete and bend them upwards. The opening into the shaft was now wide enough to crawl through.

"I'll go first," Valery volunteered.

"No, you stay here. Rita and I will crawl in," said Yura. "Rita, you really oughtn't to, of course. You'll scratch your arms and shoulders badly. But if you insist—"

"We'll all crawl in," said Val. "Valery and I also want to see what it's all about."

"I'll swear everyone's off his rocker today!" Yura exclaimed. "Well, I can't do anything about it. Hand me a rope, Valery."

He tied the rope to the concrete pipe and dropped the end into the shaft.

"I'll signal who's to go when," he said. "You'll come down last, Valery."

Yura wriggled through the opening, crawled into the cool darkness and began to slide down the rope. Before he knew it he had scraped his shoulders and elbows on the rough concrete. The

camera hanging round his neck interfered with his movements. The shaft was no more than two and a half metres deep, after which it levelled out into a horizontal passageway.

Pressing against the concrete, Yura moved forward, feet first. Soon his feet reached empty space. Bending forward, gripping the rope tightly, he lowered himself into a dark room. When his feet touched the floor he rose to his full height and wiped the sweat from his face with the back of his hand.

After his eyes had adapted themselves to the darkness he saw shelves of instruments in the faint light that entered the room through the ventilation shaft. He took a cautious step forward but stubbed his bare toe against something hard. He swore out loud. The hard object was a table leg. He ran his hand over the top of the table, feeling papers, books and some kind of blocks. At last, a table lamp! Yura pressed the button and light filled the room. He glanced round curiously.

"Did you switch on a light?" Rita called from above. "May we come down?"

"Yes, come down," Yura shouted back. He stepped over to the shaft opening that yawned in the low ceiling and explained how to crawl down.

Rita was the first to appear. Yura helped her crawl out of the shaft.

"Have you looked round?" she asked, letting her eyes run over the room.

"No, not yet. Wait a while."

Val crawled out of the shaft, followed by Valery. All four were badly scratched. Their tanned arms and legs were covered with white streaks.

They looked about. Electrical instruments, optical instruments, jars of chemicals, panels of electronic dials and a great deal of other laboratory equipment lay on the shelves that lined the walls. The long table was piled with books, white blocks and rolls of squared paper covered with charts. A canvas folding chair completed the furnishings of the room.

"We mustn't touch anything," Yura warned his companions. His face was grave; a worried wrinkle lay between his eyes. It was clear he felt a deep sense of responsibility.

A narrow opening in the wall led into darkness. Rita resolutely headed towards the opening.

"I'll go first," Yura said, putting out an arm to stop her. He carefully moved through the opening and descended a few steps. His fingers encountered a switch. Strong lights flared up beneath a vaulted ceiling, evidently the undersurface of the dome visible from outside. In the middle of the circular chamber stood an internal combustion engine connected with an electric generator.

Yura leaned over to look at the trade-mark on the generator, and raised his head in surprise. It had a capacity of six thousand volts!

"He's not here," said Rita.

Yura recalled having heard Anatole say: "I'm going downstairs." He glanced round. There it was, a hatch in the concrete floor. He gave a strong tug at the ring, and the lid came up. Holding onto rungs in the wall, Yura descended the steps in the direction of a light.

"You can come down!" he shouted as he stopped to look round.

Two white columns that were insulators stood

on the other side of a low partition. The tops of the columns went through the ceiling into a chamber where they were crowned by large metal spheres. In a deep hole at the foot of the columns there was an electric motor with a roller across which ran a wide band of silk.

The motor was in operation. Yura heard the faint swish of the silk band as it passed over the roller. A smell of ozone came up from the hole.

"Is that a Van de Graaff generator?" Valery whispered.

Yura nodded. His mind was on something else. He could not understand why everyone had gone away and left the generator running and the lights on. Then his attention was caught by something else.

A pile of thick discs about one metre in diameter, apparently plastic, lay beside the Van de Graaff generator on a support made of high-voltage insulators. On the top disc lay a sheet of copper from which an unbelievably thick cable ran to a white control panel.

"Look at this!" Yura held out his Durandal screwdriver. The neon indicator bulb in the handle shone a bright red. "Don't touch anything, he warned. "This seems to be a battery of electrets with a colossal charge from the generator. Everything here is live."

"Electrets?" Valery asked. "The things Koltukhov is investigating?"

Yura did not reply. The situation worried him. "This is quite a voltage and quite a setup," he said to himself. He walked over to the white panel of instruments and levers. The face plates of cathode-ray tubes gleamed. Inside a coil

beside the insulators hung a medium-sized knife with a yellowed handle.

"My knife!" Rita exclaimed, moving towards the coil, her hand outstretched.

"Get back!" Yura roared. "Are you mad? Look at this!"

The bulb in the handle of the Durandal was blinking away for dear life.

"This must be the main voltage node," Yura thought. "I wonder where those wires go."

Wires ran from the coil to a large cage of vertical copper tubes. The cage was empty except for two rods, joined by a cross-piece, that jutted out of the concrete floor. A piece of cloth that looked like tarpaulin or canvas lay on the cross-piece.

Yura brought his screwdriver up to one of the tubes out of which the cage was made. The indicator continued to light up.

"What's that?" Val pointed to a half-open cardboard box lying beside the cage.

Yura picked up the box. Glass ampoules sparkled in it. Before Yura had time to read the Latin name on the blue label Rita snatched the box from him. She gave the box one glance and then flung it away. Her lips quivered. She turned aside. Completely mystified, Val and Valery stared at her.

Yura alone noticed that the box had fallen on the floor inside the cage—and had vanished. It had sunk into the concrete floor without leaving a trace.

Yura stared dumbfounded at the spot where the box had fallen. This was penetrability!

"I want that knife," he heard Rita say.

He turned to her. "You mustn't touch anything."

"But it's mine!" Rita's voice rose. "Besides, you said yourself that Anatole wanted to break with Opratin and take the knife with him."

Yura shrugged. After all, it *was* her knife.

"All right," he said. "But first I'll use my camera."

He took several pictures of the mysterious cage, the wooden rods jutting up out of the floor, and the control panel with the knife and the coil.

Then he carefully examined the apparatus. The wire that ran from the knife handle was plugged into a socket in the control panel. Yura pulled out the plug. After reading what was written above the buttons, he pushed one of them, in the middle of the panel. Cautiously he switched off the magnetic starter, then brought his screwdriver up to the coil. Now the indicator did not flicker.

His heart beating fast, he released the coil that held the knife in place and drew it out of the spiral.

"Is that Fedor Matveyev's knife?" Valery whispered, breathing down his neck.

So this was Fedor Matveyev's knife! It had an ivory handle yellow with age, and a wavy pattern on the damask-steel blade, the blade that had slain the Incorporeal Brahman in the temple of the goddess Kali.

Yura placed the palm of his hand against the cutting edge of the blade. His hand passed through the steel. Valery tried to seize the blade but his hand closed over emptiness. His eyes shone with excitement.

Yura held out the knife to Rita. "Here you are. See that you don't lose it again. Are you satisfied now?"

"I certainly am," Rita replied. "Anatole was here but he left. Let's go."

"As soon as we return to town give the knife to Anatole," said Yura. "Otherwise you may land in all sorts of unpleasantness."

"You're quite right." Rita's thoughts turned to Nikolai. "Isn't it awfully dangerous to hang in the water under a boat for such a long time?"

"He'll hold out."

They climbed the steps to the top floor of the laboratory. Yura looked at the table again. This time he noticed a small flat iron box half concealed by papers. One of the sides had been removed, so that the row of tenons of the dovetail joints seemed to grin menacingly at them.

"This is it!" Yura exclaimed, seizing the box. "This is 'The Key to the Mystery'."

Indeed, it was the last of the three boxes which Count Joseph de Maistre had sketched on the final page of Fedor Matveyev's manuscript, the box that had been stolen from the exhibition in Moscow. There was the familiar engraving on the cover:

A M D G

J d M

"It's 'The Key to the Mystery'," Yura repeated, his voice solemn. "It should contain an explanation of the riddle of Fedor Matveyev's knife."

"Oh, Yura, let's look inside it," Val pleaded.

"Well, here goes. You are witnesses." Yura, pale with excitement, drew out a thick yellowed sheet of paper folded several times.

The sheet did not rustle.

"It must be parchment."

"Yes, it is." Val fingered the sheet. "Calfskin.

My, how thin it is! Calfskin was used only for the most important documents."

Yura unfolded the sheet. His eyebrows, bleached white by the sun, rose higher and higher.

What he saw was a strange drawing of a seven-pointed star surrounded by circles, with radial lines, ciphers and symbols.

"The zodiac, eh?" Yura muttered.

"Let me look." Val took the parchment from him. "Why, it's a horoscope!"

Yura was astonished. "A horoscope?"

"Yes, and evidently the horoscope of some important person."

Yura began to laugh.

"What's so funny?" Val asked.

"A horoscope," Yura groaned. "So that's what we've been hunting so long!" Laughter choked him. "That old scoundrel! He led us all up the garden path."

Valery burst out laughing too, although he had only a vague idea of what it was all about.

"Who's a scoundrel?" he asked, still laughing.

"Count Joseph de Maistre." Yura had calmed down somewhat. "He was the one who called a horoscope 'The Key to the Mystery'."

Val did not share their merriment. "Stop giggling," she said. "This might be some kind of a code. There are Latin words at the bottom."

The text under the horoscope started with the words *Anno Domini MDCCCXV*.

"That's the year 1815," Val explained. "In the middle there's another date—*MCMXV*—the year 1915. A century between the two dates."

"Look, there's something written on the back too," said Rita, who was examining the parchment. "What's this? Why, it's my name!"

The other side of the parchment was thickly dotted with circles connected by lines.

*Theodor Matvejeff † 1764** was clearly written in the top circle.

Marguerite Matvejeff was written in the circle at the bottom.

"This is the genealogy of the Matveyev family," Yura said thoughtfully. "Starting with that naval lieutenant and ending with you, Rita."

Rita gave him a startled glance. "Do you mean to say the Jesuits have been spying on our family all these years?"

"We'll soon find out." Yura took the parchment from her, folded it and put it back in the iron box. He closed the box and fitted the cover into place. "I'm taking this with me. It was stolen from a museum."

He wound the chain attached to the box round the strap of his camera and looked about him once more.

"Let's get out of here. You go first, Valery."

Valery seized the rope, pulled himself up on it, and vanished into the ventilation shaft. Val followed him. When Rita went over to the wall and grasped the rope she suddenly turned to look at Yura. She was struck by the strained expression on his face. She followed his eyes but could see nothing except the folding chair.

"What's the matter, Yura?"

"Come, climb up," he said in a low voice. He was staring fixedly at the folding chair, at the two rods with a cross-piece over which canvas was stretched. Down below, inside the cage,

* The sign † means "died". It is used in genealogies.—*Ed.*

the top of the same kind of folding chair was sticking out of the concrete floor.

The chair had sunk into the concrete floor! In the same way as the box of ampoules but not completely.

Yura shuddered. He squeezed his eyes tight and shook his head. No, it was impossible! It could not be!

"Yura!" came Val's voice from the shaft. "Yura, where are you?"

Yura shook himself. He turned out the light, walked slowly to the wall and began to climb up the rope.

The sun now hung on the very horizon. The slopes cast long shadows on the sand.

"Do you suppose Nikolai is there by now?" Rita asked.

"He must be," Valery said.

"Why did he risk it?"

"He's an excellent swimmer. Besides, you know how strong he is."

Rita gave Valery a grateful look.

They reached the camp. Their dinner hour was long past; it was time for supper. Suddenly Yura halted.

"Where's Rex?" he asked. Putting two fingers in his mouth, he gave a long whistle. "Rex!" he called.

The dog was nowhere in sight.

"You go ahead and prepare supper," said Yura. "Valery and I will look for Rex."

They found him on the shore of the southern cove, sitting at the very edge of the water. He turned round for an instant when Yura called to him, shifted his paws restlessly, and turned back to stare into the water.

Yura and Valery ran down the slope to the beach and came to an abrupt halt. The cove was swarming with water snakes. Holding their heads above water, they were swimming out to sea. From higher up the beach more and more were slithering out of their holes and heading for the water. There were hundreds of them, all good swimmers. They were accustomed to migrating from island to island in search of birds' eggs, but such a mass-scale exodus was extraordinary.

"It's all very strange, their deserting this island," said Yura. "Something is worrying Rex, too."

He lay down on the beach beside Rex, and suddenly felt faint, wide-spaced earth tremors. What a damned island!

"Let's go up to the big crater!" he cried, springing to his feet. "Rex, come with us!"

Warm grey volcanic mud usually flowed slowly over the edge of the crater. Now the flow had stopped, and the mud was hardening.

"The crater is closed," said Yura. "What do you know about that?"

"Is it a bad sign?" Valery asked.

"Yes, very."

When the two young men returned to camp they found the girls busy round the fire. Val was telling Rita something about horoscopes, while Rita kept one eye on the fish stew.

"No need to upset them," Yura thought. "It may all blow over. At least, we won't tell them till the launch arrives. It probably won't come this evening. Most likely tomorrow morning. I wonder how Nikolai made out. What a stubborn devil he is! And what a day this has been!"

They ate the now unbearably tiresome fish stew in silence.

Val sighed. "It seems impossible to believe we'll really be home tomorrow. Imagine—a hot shower, clean sheets, and food that doesn't taste of fish."

"Just wait, Val," said Rita. She sat up straight, her body tense, listening. "I may be imagining things but it seems to me the earth is moving."

For a time there was silence round the fire.

"I may as well tell you," Yura remarked casually, removing a fishbone from his mouth. "Something's happening inside the earth. The craters, which are safety-valves for gas that is compressed by tremendous pressures, are blocked up. Now the gas is bubbling deep down inside the earth, seeking a way out—"

"Where will it come out?" Val asked.

"If we only knew! Or when— Perhaps a hundred years from now—or in a minute. On the whole, that's the situation." He rose. "Get your things together. We're moving out to the raft. We'll be safer there."

It took them only half an hour to break camp. The population of Ipaty Island, with all its possessions, migrated to the raft.

Time passed slowly. The underground rumbling suddenly grew much louder. Whimpering, Rex pressed himself against Yura's leg.

All of a sudden the island rocked as a white pillar of gas flew up out of the moving ground. A shower of pebbles and chunks of clay drummed down on the raft. Fierce heat hit their faces. Fire flashed. A gigantic torch leapt skywards with a roar.

CHAPTER SIX

WHICH TELLS OF FIRE AND WATER

Nikolai waited a few seconds after the stern of the motorboat settled into the water, then cautiously raised his head beside the bow, knowing that he could not be seen from where the men were seated.

The boat had cast off. Nikolai could hear the clink of metal. Bugrov must be putting the ignition distributor back in place.

"You're always in such a tearing hurry," Nikolai heard Bugrov grumble. "I didn't even have a chance to catch any fish. There's lots of fish here. See all those bubbles on top of the water?"

"Stop chattering," came Opratin's hard voice.

"They don't suspect anything," Nikolai thought. "I mustn't lose any time. I'd better make myself comfortable here under the bow."

He quietly drew one end of his rope through the lifeline hanging over the starboard side. He ran the other end of the rope through the lifeline on the port side. Then he tied the two ends together under the water and thrust his arms through the loop so that the rope ran under his armpits. Now the two aqualung cylinders pressed against the bottom of the boat, with the keel beam between them.

"Not bad at all," Nikolai thought, gripping the rope, his arms bent at the elbows. "It won't be so bumpy."

The motor began to drone evenly, and the boat moved away from the shore, slowly at first, then faster and faster. The headland swam into view and vanished.

As the boat ploughed forward its prow rose

into the air, lifting Nikolai's head and shoulders out of the water. He now breathed through the snorkel to save the air in the cylinders.

He calculated that the motorboat should cover the fifty miles to town in about five hours. The cylinders of the aqualung held about 2,000 litres of air. He had used up some two hundred litres swimming underwater to get to the motorboat. The aqualung could be used until the pressure in the cylinders dropped to thirty atmospheres. This meant the last four hundred litres could not be used. Near town he would have to drop off and swim underwater for ten minutes or so. That gave him 1,000 litres for the trip, in other words, half an hour's supply of air. It was to be used in case a head sea prevented him from breathing through the snorkel. He must try not to make unnecessary movements. Still, he could not get along on less than thirty litres of air a minute.

Everything went well at first. Skimming above the smooth sea, Nikolai enjoyed the water that streamed round his body. His feet, supported by broad flippers, trailed behind. The cylinders on his back pressed firmly against the keel beam.

But soon the boat encountered a head sea. The prow rose and fell, and Nikolai had to adapt himself to this by inhaling only when the prow was out of the water. Even so, water got into the snorkel now and then, and Nikolai did not always have time to clear the tube.

Once, when the prow rose high out of the water, Nikolai saw, on his left, the sun shining brightly on black rocks surrounded by foamy white surf.

He knew these rocks. He felt as though he had been under that keel, lashed by the waves, for an eternity. Yet they had only covered about five miles, one-tenth of the distance!

Nikolai was getting used to meeting the waves head on, but his body was growing chilled from the wind and the water. Evidently the oil he had rubbed into his skin was being washed off. He felt colder and colder. The rope to which he was clinging cut into the palms of his hands.

A sharp pain twisted the big toe of his left foot and quickly rose to his calf. With difficulty, he turned on his right side. Bending his knee and then straightening out his leg, he struggled desperately against the cramp.

Suddenly he heard the motor slow down. The prow sank into the water. He was now submerged. The boat came to a stop.

Breathing at once grew easier. The motionless water seemed much warmer. Nikolai cautiously thrust his head out of the water.

"Why must you take a dip now?" he heard Opratin's irritated voice ask. "Why can't you wait?"

"Why wait? It's hot," said Bugrov. "Just a quick dip. There's Bull Island on the left. That means we're halfway."

"Only halfway? We're going very slowly today."

"You're right," Bugrov agreed. "I wonder why."

Opratin spoke again. "By the way, where did you pick up Anatole Benedictov in town?"

"Where we agreed—at pier 16. Then we went to pier 24 to pick you up."

"Was there anyone else on 16? Did anyone see you?"

"I don't think so. Why?"

"Oh, nothing. Hurry up and take your dip."

The boat listed and there was a splash. Bugrov must have dived from the stern. Nikolai slipped out of the rope, turned on the air valve, and, twisting his body so that he faced the bottom, dived.

While Bugrov splashed about the stern, Nikolai waited to one side, at a depth of three metres. That clown was hot and wanted to cool off, so he, Nikolai, had to expend some of his precious air! True, this break gave him a chance to stretch his stiff arms and legs and warm up. How thirsty he was! He had not had anything to eat or drink since morning. His mouth felt horrible from swallowing salt water. And only halfway there—two hours more—an eternity. Oh, for a cup of hot tea! The strong tea Mehti brewed at the marina.

There was a rattling sound in the boat. Working his flippers energetically, Nikolai swam up to the bottom of the boat, gripped the rope again, and switched his breathing to the snorkel.

The motor came to life. The waves that beat against him kept sending water into the tube. Before he managed to blow it through he took another gulp of sea water. He was growing steadily colder. His body did not have time to compensate for the heat that the air and water were carrying off.

A transparent edge of water splashed in the plexiglass eyepiece of the mask. Every now and then Nikolai lifted his head out of the water by raising himself on the rope. The sea had grown darker, and so had the sky. A crimson sun hung in the sky to the left, ready to sink into the sea.

Something black suddenly flashed before his eyes, followed at once by a painful blow on his left shoulder.

It was a heavy, watersoaked log which could easily have ripped a hole in the bottom of the boat. But luckily it only hit the boat a slanting blow on its port side after scraping Nikolai's shoulder.

"A close shave," Nikolai thought, unaware that his shoulder was bleeding. He did not know which was worse—the constant cramps in his legs or the nausea caused by loss of blood, the cold, his thirst and the large amount of sea water he had swallowed.

The nausea, the cramps, the tearing pain in his shoulder and the cold water sweeping over his tortured body began to obscure his consciousness. "You told me to think of a way out. Well, here it is. It's all for your sake. Sitting beside the fire with you was wonderful. Your hand I dare not touch. Your hand I dare not touch."

The drone of the motor intruded into his fading consciousness. With a great effort he lifted his head.

Lights ahead! The red and white lights of the channel buoys winked in the twilight.

Lights had been switched on in the city too. He'd made it!

Nikolai turned on the cylinders and climbed out of the rope. Placing his flippers against the bottom of the boat, he shoved off.

How black the water was! Inhale—exhale—inhale—exhale—

He came to the surface and pulled out the mouthpiece. The boat was no longer in sight.

To the left—he must swim to the left, in the direction of the marina.

That evening dockmaster Mehti climbed into his dinghy, as usual, and set out to see if all the sailboats were properly tied up at their buoys.

Old Mehti was in a foul mood. Almost two weeks had passed, and no *Mekong*. Nikolai was an experienced sailor, but why hadn't he informed him about the delay? He had rung up Lenkoran and talked with the coastguards there. They told him the *Mekong* had not entered the mouth of the Kura. They had promised to send a launch to search among the islands.

His job at the marina was becoming altogether impossible. He had no time to do anything but take phone calls. From one woman in particular, who said her daughter was aboard the *Mekong*. She cried as she talked to him. He could not understand why the men had taken girls with them. When you had women aboard you had tears. That was a well-known fact.

Mehti steered his dinghy up to buoy No. 2. The *Hurricane* was well tied up. But why was there a man with cylinders on his back and flippers on his feet lying on the deck?

"Hey, you, this isn't a hotel!" Mehti shouted angrily.

The man did not stir. Mehti climbed aboard the sailboat. He bent over the man, who was lying face downwards, a mask clasped tight in an outstretched hand, and turned him over.

"Nikolai," he muttered in astonishment.

It was all of twenty minutes before Nikolai recovered consciousness. His limbs jerked spasmodically. The light hurt his eyes. When he

tired to throw off the blanket Mehti had laid over him his arm refused to move.

Suddenly he realized that he was lying in the dockmaster's quarters at the marina. He saw Mehti's face bending over him. He heard Mehti's familiar, grumbling voice.

"Ipaty Island," he said hoarsely, his tongue moving with difficulty. "Send a launch—Ipaty Island—" Then he fainted again.

The ambulance which the dockmaster had summoned sounded its horn.

After Nikolai was driven away to hospital Mehti rang up the port authorities to notify them that he was putting out to sea in a launch.

He could not understand how Nikolai had reached the marina. It was nonsense to suppose he had swum all the way from Ipaty Island. The days of miracles at sea were over. But one thing was certain: something had happened to the *Mekong*. Mehti put a first-aid kit into the launch. He was bending over the engine, tuning it up for the trip, when he noticed a glow in the sky.

The rosy-hued reflections of a distant fire shone in the southern section of the evening sky.

Mehti climbed back to the pier from the launch. He stood there wondering what to do, his gnarled fingers moving impatiently. First, he must find out where the fire was. He stepped into his office but before he could lift the receiver the telephone rang.

"Mehti? Port duty officer Seleznov here. You just told us one of your boats was stranded at Ipaty, didn't you? Well, we're sending a torpedo boat to that area to investigate the fire. Want to come along?"

"Of course I do," Mehti replied.

The torpedo boat slid up alongside the pier soon after. "Climb in, Mehti, and we're off," the tall, helmeted captain shouted from the deckhouse.

Mehti sprang onto the deck. "How are you, Konstantin," he said, shaking hands with the captain. "Haven't seen you for a long time."

"Since last year's regatta. How have you been keeping, old man?"

The engines revved up, and the torpedo boat swung round and headed out of the bay, leaving two long trails of white foam behind.

Mehti sat down on the low deckhouse railing. Two men in civilian clothes were standing on deck, and several more were below in the tiny cabin. Mehti guessed they were oil experts and oilfield firemen.

When they were well out of the bay the captain nodded to the petty officer beside him and the officer pressed the lever of the accelerators. The engines roared deafeningly and the launch leaped forward. The glasslike bow-wave was motionless and pink in the glow of the fire.

Mehti descended the narrow ladder to the cabin, where he sat down on a folding chair. It was quieter down below. The oil experts were exchanging brief comments. Some thought the fire might be at the oil well on High Island, the well farthest out in the archipelago.

The captain came down the ladder. "My radio operator says the situation on High Island is normal. From there they can see the fire to the southeast. A message from a fishing village at the mouth of the Kura reports that a fire can be seen in the northeast."

He spread a map on the table. "It must be somewhere in the Ipaty area," he said.

Mehti went up on deck. The ominous red glow that filled the sky and the sea was growing brighter by the minute. Soon a pillar of fire came into view. There was no longer any doubt about it. Ipaty Island was in flames.

Mehti stared in silence at the giant torch erupting out of the sea.

"Was this where your young people were?" the captain shouted in his ear.

The dockmaster did not reply. His face, lit up by the fire, was stony.

Advancing from the weather side, the torpedo boat slowly approached what had only recently been an island. The water at the foot of the gas torch seethed and raged.

"Ipaty has gone to the bottom," someone said gloomily.

"We must extinguish this fire," one of the oil experts said, shielding his face from the heat with his hand. "If the wind rises the fire may spread to the rigs on Turtle Island—and there's gas there too."

The torpedo boat circled around the remains of the island. It pitched heavily, for the sea bottom was still shifting and the sea was turbulent.

"May I take a look?" Mehti asked the captain.

He trained the binoculars on the reef and saw the black skeleton of the sailboat. Tongues of flame were still licking the deck. Mehti lowered the glasses. His face was expressionless. Big tears rolled down his bristly cheeks.

A call was sent out for fire-fighting launches. Several of these manoeuvrable little boats with

high superstructures arrived on the scene an hour later. Surrounding the pillar of fire, they trained powerful jets of water on its base.

The fire put up furious resistance. First it retreated hesitantly, then leaped forward in an attack on the launches. The paint on the launches cracked and peeled off in curlicues. The fierce heat scorched the sailors in their asbestos suits.

Although the launches were tossed from side to side by the waves the firemen, most of them former navy gunners, firmly controlled the hoses. They crossed their jets of water at the base of the pillar, to sweep the flame off the surface of the sea.

It was impossible to tell whether it was night or day.

Finally the jets of water sliced off the pillar of fire at its base. After a last burst of flame the fire died away.

Darkness fell instantly. It was not exactly dark, though, for the sky was just beginning to grow light in the east. Could it have taken an entire night to fight the fire?

Dockmaster Mehti asked the captain to come as close as possible to the reef. He stared at the blackened framework of the sailboat for a long time.

The captain touched his shoulder. Mehti silently gave him the binoculars: He slowly went down to the cabin, stretched out on the little sofa, and turned his face to the wall.

Their engines roaring, the torpedo boat and the fire launches moved away from the island that no longer existed.

CHAPTER SEVEN

IN WHICH AN INCORPOREAL MAN APPEARS ON THE SCENE AGAIN

Nikolai Opratin sat on a bench on Seaside Boulevard, watching the crowds strolling past him. It was a hot summer evening, and the entire city was streaming towards the sea.

The clicking of triggers came from the shooting-gallery. The majestic strains of Tchaikovsky's First Piano Concerto floated from the bandshell.

There was not a single vacant place on the benches. On Opratin's left some young people were eating ice-cream and laughing. On his right others were joking and laughing. "What a pack of fools!" Opratin thought disdainfully. "Cackling like geese."

He found he was unable to concentrate. This had never happened before, and it made him angry.

He had returned from the island only two hours before. From the pier he had taken a taxi home, where a cold shower had failed to dispel his anxiety and despair. A vein under his left eye throbbed annoyingly. He examined his face in the mirror and pressed the vein with a forefinger, but it did not stop throbbing.

He felt that he simply could not remain at home alone. He had to get outdoors. A few minutes later he put on his straw hat and went out to sit on a bench on the boulevard.

How had it all happened?

After Anatole went below, Opratin remained alone for a while, studying the charts of the

latest experiments. He was upset by the talk he had just had with Anatole. That miserable dope fiend! Wanting to surrender the hard-won fruits of their labours! He certainly was not going to let that happen. First, he'd see to it that Anatole and the Institute parted company. He knew he could convince the director that Anatole had to be dropped because he was no longer suitable for his post. Then he would render Anatole helpless by confiscating all his papers and the records of the experiments. The knife, too. Actually, though, the knife was not really needed any longer. There were "charged" pieces of metal and a portable installation.

Opratin gathered together the papers he needed and went downstairs for the portable installation.

Anatole was dozing in the folding chair, inside the cage. He must have given himself another shot in the arm. Opratin kicked the box of ampoules that lay on the floor. He stared down at Anatole, frowning. The puffy face, the rumpled hair, the hoarse breathing. A living corpse, actually.

As he picked up the black attaché case containing the portable installation Opratin became aware of a faint rustling and crackling. He glanced at the control panel and swore under his breath. The Van de Graaff generator was switched on. The endless silk band rustled from pulley to pulley, carrying a flow of static charges to the spherical tips. And the tips were strongly charged as it was.

Anatole was a maniac! He must have again tried to adjust the installation by increasing the field intensity.

Restructured matter was not supposed to drop

downwards; the earth's gravitational field pushed it up. Or, at any rate, this had been the case in the beginning. But in recent weeks the installation seemed to have gone mad. The concrete floor of the cage swallowed up everything thrown into the cage.

Lately, the cage seemed to draw Anatole like a magnet. He would fuss with it for hours, rearranging the pipes and the wiring. What is more, he had developed the dangerous habit of taking a siesta in the cage. Time and again Opratin had warned Anatole not to climb into the cage because he was absentminded and might easily forget to switch off the installation.

This time Anatole must have turned off the installation after his latest experiment but had forgotten about the Van de Graaff generator.

As Opratin was on his way to the control panel to switch off the generator a low crackling sound came from above. He stopped short. A dazzling white sphere the size of a basketball came rolling out of the generator column with a swish.

Globe lightning!

Opratin stared dumbfounded at the glowing fire-ball. The scorching clot of energy was heading straight for his feet, giving off sparks as it rolled along. Opratin backed towards the steps which led to the hatch. The cover of the hatch was open; a breath of wind could send the fire-ball upwards and out through the hatch. But what if it exploded down here instead?

The fire-ball swayed gently and glided upwards, almost into Opratin's face. Then it floated along in front of the control panel.

Opratin felt behind him for the steps, then swung round and scrambled upstairs. But before

he could jump out of the hatch there was a flash of dazzling light, a short hiss, and a sharp metallic click. A blast of heat struck his back.

Forcing himself to turn round, he saw that the fire-ball was gone. It had disintegrated without exploding.

The cage was empty—except for the upper part of the folding chair jutting up out of the floor.

Opratin, horrified, closed his eyes. His heart beat violently.

He stepped out of the laboratory and stood before the door for a moment to get his face and hands under control. Only after his hands stopped trembling did he lock and seal the door.

Dimly, in the background of his consciousness, he heard the ceaseless scuffle of the feet of the animated and colourful summer throngs promenading along the boulevard.

What was he to do? How could he explain Anatole's disappearance? If he told the truth, no one would believe him. You only had globe lightning during a thunderstorm. There had been no thunderstorm. No one had ever heard of a man-made fire-ball. Who would believe that a Van de Graaff generator had produced one?

Opratin shuddered at the memory of the flash of light and the metallic click. As the fire-ball floated past the control panel it had activated the magnetic starter of the installation.

An accident during an experiment? But then there would be an inquiry, and the installation, which had nothing to do with cloud condensation and the level of the Caspian, would be discove-

red. People would want to know where Benedictov's body was. No, no—not that.

What if he said that Benedictov had remained behind alone on the island to finish a series of experiments, and had probably drowned while bathing? His body had evidently been carried out to sea. But Bugrov knew that Anatole hated sea bathing. Should he talk to Bugrov? No, that scum of the earth had been looking daggers at him lately. He would not hesitate to claim that he had been forced to steal from a display case in a museum.

Should he tell the whole truth? After all, he was in no way to blame for anything. He was on the verge of a major breakthrough in science. It was not his fault that Benedictov had fallen victim to his own absentmindedness. Yes, he'd make a full confession, and let come what may.

Suddenly he heard alarmed voices. Raising his head, he saw a wavering glow on the southern horizon. Something was burning far out at sea.

Opratin pushed his way through the crowd and headed for home. He did not sleep a wink all night. He paced the floor, he flung himself into an armchair, then sprang to his feet and paced the floor again—

Early next morning his telephone rang.

"A big crater erupted on Ipaty last night," came the excited voice of the Institute director. "The Island no longer exists."

Opratin was struck dumb. He passed the palm of his hand over his inflamed eyes.

"That's terrible," he said into the phone at last. "Anatole Benedictov was on the island."

Ipaty no longer existed.

Opratin took a shower, shaved himself slowly and thoroughly, and dressed carefully. When he set out for the Institute he was his usual smart, dapper self.

Four days later a white launch chugged up to the marina. Four fantastically-garbed young people stepped out onto the pier. One was a lanky young man with a tawny beard, wearing only shorts and, on his head, a faded kerchief; camera and binoculars straps ran across his chest in opposite directions. Another was a round-faced, swarthy, black-haired youth in blue swimming trunks with a fishing rod in one hand and a transistor radio in the other. There was a fair-haired young woman in a torn red sun-dress, the tatters held together with safety pins. The fourth was a pretty brunette with big black eyes who, despite the hot day, was wrapped in a yellow-striped green blanket. All were deeply sunburnt and barefoot. A tiger-striped yellow boxer brought up the rear.

The sailing enthusiasts at the marina stared in amazement at the procession. When they realized that the man with the tawny beard was Yura Kostyukov they rushed up to shake his hand. Dockmaster Mehti vigorously pumped Yura's arm and then turned to shake hands with Yura's companions.

The four had drifted on the becalmed sea for three days. On the morning of the fourth they were picked up by a rescue launch from Lenkoran that was searching for them in that area.

"You can thank Nikolai Potapkin for saving your lives," Mehti said to Yura. "He was the one

who told us you had a raft. If we hadn't known that we wouldn't have outfitted search parties. We would have thought you all perished on the island."

One of the boating people offered to drive the four of them home and they left the marina in his car.

"Well, we're back home again, old man," Yura said to Rex as the car drew up in front of his house. He thanked the driver and ran up the stairs to the fourth floor. Rex leaped and danced in front of the door. No one answered Yura's ring. "They're not back yet," he thought thankfully. His parents had left for a holiday in the Caucasian spa of Kislovodsk just before the cruise.

Yura picked up his key from the neighbour with whom he had left it, and entered his flat.

First, a hot shower. Yura scrubbed his body energetically with a stiff loofah. The water that ran down the drain was black. He soaped again and again. Finally, when his skin squeaked under his hands, he heaved a sign of relief. What a job it had been to remove all that dirt!

After he had dressed, Yura glanced into the kitchen. Rex was drowsing on his pad. When he saw Yura he rose and gave a long yawn.

"You'll stay at home," Yura told him. "I'll run over to see how Nikolai is getting along. I'll bring you back something to eat. Would you like some fish?"

Rex barked his indignation.

Yura had learned from dockmaster Mekti that Nikolai was in hospital—the same hospital where Nikolai's mother was employed as a nurse. Arriving at the hospital, he asked for her. When she came down into the lobby and saw

Yura her face lit up. She embraced him and shed a few tears. "Forgive me for weeping," she said. "It's so wonderful to see you. I had been told—"

"How is Nikolai?"

"Much better. He has pneumonia, you know. Besides, he lost a lot of blood from a deep cut on his shoulder where a log scraped it. He keeps asking for you. I've been telling him you're in town, but that he can't see you yet because the doctors don't allow him any visitors."

"I must see Nikolai at once."

"I'm sorry, not today, dear. He's still weak. Come tomorrow."

"May I send him a note? It's extremely important."

"Well, all right."

Yura tore a page out of his pad and quickly wrote: "Hi, old man. We're all safe and sound and dying to see you. Meanwhile, just one question: was Benedictov in the motorboat?"

"All he has to answer is one word—yes or no," Yura said, handing the note to Nikolai's mother.

"It's our last hope," Yura thought as he restlessly paced the lobby waiting for Nikolai's mother to return. "If only the answer is yes. Then we can forget all about that dreadful top of a folding chair sticking out of the concrete. If only—"

A few minutes later Nikolai's mother came down the stairs. She handed Yura a sheet of paper on which the word NO was printed in block letters.

When Rita entered her flat she could tell at once that Anatole had been living at home. The bed

was unmade, his pyjamas were tossed over the back of a chair, and half a glass of cold tea and a sugar bowl stood on the table. He must have left Opratin's place and been living at home all the time she was away.

She rang up the Institute of Marine Physics but it was the end of the day and no one came to the phone. She stood lost in thought for a while, then dialled Opratin's number. The phone rang and rang without an answer.

Her mother was visiting relatives in Rostov. Whom else could she phone? What a pity Nikolai could not be reached.

Rita took a bath, then called Opratin again. This time he answered. "Rita?" he asked in astonishment. "Are you in town?"

"Obviously. Where's Anatole?"

"Excuse me—" Opratin fell silent for a few moments. Then he said: "You ask about Anatole's whereabouts. Don't you know what happened?"

"What's happened?" she cried, pressing her hand to her heart. "Tell me at once."

"I hate to be the one to break the news. Anatole was working in our island laboratory. He was killed when the island suddenly blew up."

"You're lying. He wasn't in the laboratory."

"I realize the state you are in," Opratin said gently and with sympathy. "Believe me, I am quite sincere when I say—"

"It's a lie!" she cried furiously. "He left the island with you. What have you done to him, you horrid creature?"

"If you're going to carry on like this I must say goodbye."

Rita heard a click, and then the line went dead. She slowly replaced the receiver. For a

moment she stood motionless, her arms hanging by her sides, in the deathly silence of the empty flat. Then she snatched up the receiver and dialled Yura's number. No one came to the phone. She waited a few minutes, then tried again. Still no Yura.

On leaving the hospital Yura took a taxi straight home, locked himself in the bathroom, turned off the light, and set about developing his last roll of film.

On the other side of the bathroom door hungry Rex whined. The telephone rang frantically. Yura was too busy to go out to answer it. "It must be Val," he thought. "I'll call her back as soon as I'm free."

Snatching the wet film out of the fixer, he switched on the light and studied it frame by frame. The negatives of the pictures he had taken in the island laboratory did look odd. There it was—the cage, the back of the folding chair jutting up out of the concrete floor, and below it a vague whitish spot. What the devil was that? How could the camera have photographed what was under concrete?

Yura turned on the fan to dry the film more quickly.

Now for the printing. He ran the roll of film through the enlarger until he came to the frame with the cage. He printed an enlargement of it and tossed the paper into the developing tray. In the red light the cage and then the crosspiece of the chair showed through slowly, as though unwillingly. He could see the hazy outlines of the chair itself and—

Cold shivers ran down his spine.

Now the vague contours of a human body were emerging. The body was reclining in the folding chair and had been photographed from a strange angle—from almost directly overhead.

Bugrov felt terrible. The man sitting on the other side of the desk knew far too much about him.

"Whom did you buy the drugs from?"

"I don't know his surname," Bugrov replied sullenly. "They called him Mahmud."

"The one who used to stand on the corner of Ninth Street, near the filling station?"

"Yes."

"Well, Mahmud's been arrested."

Bugrov scowled at the investigator. "I didn't buy the drugs for myself."

"I know you didn't." The investigator's voice hardened. "But you bought them, and you ruined a man."

Bugrov leaped to his feet. "That's a lie! He ruined himself. I refuse to be held responsible. He begged me to buy him the drugs. Do you think I—"

"Calm down," the investigator said. "I'm not accusing you. He could not get along without them, poor chap. Now tell me this. What were the relations between Nikolai Opratin and Anatole Benedictov—"

"They squabbled all the time. They'd start quarrelling every time we set out for the island and they'd keep it up all the way."

"What about?"

"How do I know? I don't know the science part of it. Opratin wouldn't let me any farther than

the motor compartment. I think there was a hitch of some kind."

The investigator asked Bugrov to describe the last trip to the island in the minutest detail.

"So you left Benedictov in the laboratory, did you?" he remarked after Bugrov finished his story. "You sealed the door and left. Is that it?"

Bugrov stared at him in astonishment.

"Who'd seal a door if there was a living person inside?"

"H'm, a living person, you say?" The investigator stared intently into Bugrov's eyes. "Did you climb up to the pill-box before you left the island?"

"No. I was busy tinkering with the engine."

"What did you and Opratin talk about on the return trip?"

"What did we talk about? I don't remember talking at all. He was like an owl."

"But you did talk all the same. When you stopped the boat to take a dip."

On hearing this Bugrov was more astonished than ever. "Why, that's right," he said. "We spoke of how slow the boat was going."

"Anything else?"

"He asked me on what pier I had picked up Benedictov. And whether anyone had seen us."

The investigator nodded and wrote something down. "Now we're getting somewhere."

"He talks as if he was in the boat with us," Bugrov thought. "Maybe Opratin told him about it. But no, that slick customer wouldn't go talking to the law."

The investigator carefully took a small, flat iron box on a chain out of his drawer and laid it on the desk in front of Bugrov.

"Ever seen this before?" he asked.

Sweat broke out on Bugrov's forehead. "I'm sunk!" he thought, searching in his pocket for a handkerchief.

"As far as I'm concerned," Bugrov said in a bored voice, "this little piece of iron junk is the last thing I'd want. I took it for scientific purposes."

"You stole it."

"Have it your own way." Bugrov pushed away the chain disdainfully with his little finger. "I just gave it a little snip with a pair of pliers, that's all. I didn't take it for myself."

"You'll have to answer for this museum theft."

Bugrov turned to look at the sky outside the window. He wouldn't be able to wriggle out of this one.

"It's a pity. The Institute gave you very good references. Well, you may go now. Just sign this statement promising not to leave town."

Nikolai Opratin drummed with his fingers on the black attaché case lying in his lap and said evenly, "You have no right to level such a charge against me. It's slander."

The investigator placed a folder on the desk. He had spent quite a few days studying the papers inside the folder before he summoned Opratin for questioning.

"Please answer the question," he said shortly. "Why did you lock and seal the door before leaving the island?"

"I did nothing of the sort. I left the key and the seal with Benedictov."

The investigator gave Opratin a severe look. Opratin met it calmly.

"What did you ask Bugrov on the way back when he stopped the boat to take a dip?"

"I didn't ask him anything."

The investigator pressed a button and said to the man who entered: "Show Bugrov in."

When Bugrov entered the room a few seconds later Opratin did not glance at him.

"He asked if anyone had seen Benedictov get into the boat when I picked him up that morning," Bugrov said in reply to the investigator's question. "They boarded the boat at different piers."

"I never asked such a question," Opratin said quietly.

"What do you mean?" Burgrov exclaimed. "You certainly did!"

The investigator stopped him with a gesture. "We have a witness," he said, pressing the button again.

This time Nikolai Potapkin entered the room. Opratin measured him with an indifferent glance, then looked pointedly at his watch.

Nikolai confirmed that Opratin had talked with Bugrov on the trip back from the island.

Opratin shrugged. "This whole business is absurd. Assuming, for a moment, that we actually did talk, how could this young man have heard it, in the middle of the Caspian?"

"This young man travelled from Ipaty Island to the mainland hanging onto the prow of your motorboat," said the investigator. "That has been verified and is absolutely true. Now I want to ask you another question," he said, turning to Nikolai. "What did Opratin and Benedictov talk

about in their underground laboratory before the latter vanished?"

Nikolai repeated the conversation. Bugrov stared at him in bewilderment, his mouth open.

"Do you admit that such a conversation took place?" the investigator asked, turning to look squarely at Opratin. "Do you admit that you and Benedictov had a bitter quarrel?"

Opratin did not reply at once. His fingers drummed nervously on his attaché case. It appeared those youngsters had been on the island. He had never suspected it. He had been vaguely disturbed ever since Benedictov's wife had screamed into the phone that he was lying. He had hung up at once. He had thought she was simply upset. But now it turned out that— What else could they have seen? But they could not possibly have entered the laboratory— They did not have a shred of evidence. The laboratory had blown up, and Benedictov together with it.

"Th-there was no such conversation," said Opratin in a hollow voice.

"Was there no ventilation shaft in your pill-box either?" Nikolai shouted angrily.

The investigator pressed a button to summon Yura and Valery, who confirmed Nikolai's words.

All eyes were now turned on Opratin. He slowly passed the palm of his hand over his damp, thin hair.

"Very well," he said slowly, choosing his words. "Let us assume that I did quarrel with Benedictov." (Be calm, get a grip on yourself.) "What of that? We quarrelled, I left, and he remained to complete the work on hand. On that very day the big crater erupted. The laboratory was destroyed, Benedictov was killed."

"You killed him!" Yura cried.

"That's a lie!" Opratin turned a pale face to him. "That's a despicable lie."

Yura strode to the table. "You switched on the installation and killed him. Show him the photographs."

"Don't rush things, young man," said the investigator. Turning to Opratin he said: "There was a setup in your laboratory that had nothing to do with cloud condensation. I have pictures of the equipment and a statement by your director. Take a look."

He spread several large photographs on the desk. Opratin said nothing. He looked at them indifferently, one by one, until he came to the last picture. He stared dumbfounded at the picture of the cage inside which could be seen the dim contours of a folding chair and the outlines of a human body photographed from directly above.

Opratin pressed the tips of his fingers to his eyes. Under his left eye a vein throbbed. His cheeks paled.

With a nod to the witnesses the investigator indicated that he wanted them to leave the room.

"Well?" he asked.

Opratin was sitting in a strange manner, knees drawn up so that his feet were not touching the floor. He now had control of himself; his expression was solemn. His fingers drummed nervously on the nickel-plated clasp of the black attaché case in his lap. The clasp gave a loud click.

"Well?" the investigator repeated.

Opratin said nothing. He sat tensely poised, his gaze fixed on the distance. His lips moved

almost imperceptibly, as though counting off the seconds.

"Has he gone round the bend?" the investigator wondered. He pressed a button.

"Lead the prisoner away," he said to the sergeant who had entered and halted near the door.

Opratin rose in an odd manner, almost as if he had jumped up.

"You'll hear more about me," he said in a remote voice, moving towards the door.

"You're under arrest. Detain him, sergeant."

The sergeant took up a position in front of the door and raised his hand. Opratin halted for an instant, then moved to the side, walked straight through the wall beside the door, and vanished.

The sergeant stared round-eyed at the investigator for an instant, then rushed out into the corridor, followed by the investigator. They saw Opratin walking down the corridor. He was moving like a robot, taking slow steps, woodenly placing his feet flat on the ground, as though he were testing the strength of the floor. In his right hand he still held the black attaché case.

The sergeant caught up with him and stretched out his hand to seize him by the arm. But his hand went through Opratin's arm as though through air. All the sergeant felt was a light puff of warm air.

"Follow him!" cried the investigator. "Hurry! Don't take your eyes off him!"

Hearing the shouts on the floor above them, Nikolai, Yura and Valery halted in the lobby. Opratin was descending the stairs and coming straight towards them. They stood shoulder to shoulder to bar his way. Opratin did not turn

aside. He walked straight through them, then through the astounded man on duty at the door, who tried to stop him, and out into the street.

His face white and tense, he walked without stepping aside for anyone. He paid no attention to the shouts of the investigator and the sergeant who were following him, or to the three young men who were on his heels.

For the first time in his life Opratin was displeased with his own conduct. What in the world had he been thinking of? He had made one stupid blunder after another. He should have told the whole story at once. He should have admitted that although the laboratory was being used for experiments that were not in the programme these experiments would lead to a major breakthrough.

He should have told the truth, as he had wanted to at the beginning. The whole truth about the apparatus, about Benedictov's carelessness, and about the fire-ball. Who could have expected those damned youngsters to get into the laboratory?

And in the first place, he shouldn't have gone to the investigator's office when he received the summons. How could an investigator be expected to understand all this? He would simply look on it as a crime. This case should be examined by a committee of scientists. He should have gone higher up at once. He should have said straight out: we've obtained a remarkable scientific result.

It was not too late now, either. Within half an hour he would be in touch with the right people. He would tell them he had kept quiet about Benedictov's death simply because he

had panicked. They would understand that, and appoin ta committee of inquiry. He would be allowed to carry his experiments through to the end.

On reaching the intersection Opratin stepped out into the heavy traffic without a glance either to the right or to the left. A bus bore down on him. The driver, his face distorted with fear, tried in vain to brake in time. Opratin felt a moment's terror but then—

The passengers saw a clean-shaven, well-dressed man cut off at the knees by the floor of their bus, pass through them without touching a single person, and disappear, leaving behind a faint odour of eau de Cologne. It was all over before they had time to exclaim in fright or astonishment.

Meanwhile Opratin, quite unharmed, had reached the other side of the street and was walking on, swinging his attaché case in time to his wooden steps. He paid no attention either to people or to cars. One more block and he would be close—

He was slowly crossing the street when a heavy lorry turned the corner. Opratin did not even glance at it.

There was a piercing shriek. Tires squealed. Its engine giving a sharp bang, the lorry came to such a sudden stop that the driver's chest was pressed against the steering wheel and he lost consciousness.

A crowd instantly gathered.

The body of the ghost-man hung in an unnatural, twisted position on the front of the lorry, his right arm plunged into the bonnet up to the shoulder.

The black attaché-case had been thrown some two metres away from the lorry. It lay half buried in the roadway.

Penetrability had suddenly ceased, and Opratin's body had regained its normal properties at the very moment when his right arm had moved into the space occupied by the running engine. The particles of Opratin's arm and of the lorry engine had intermingled into an unbelievable mixture. The engine had immediately gone dead.

Nikolai and Yura pushed their way through the crowd to the lorry and stopped short, overwhelmed by what they saw.

A siren sounded. The crowd parted to make way for an ambulance.

CHAPTER EIGHT

IN WHICH OPRATIN'S INNOCENCE IS ESTABLISHED IN A SOMEWHAT UNUSUAL MANNER

On that particular Saturday evening Boris Privalov lay on the sofa, reading and smoking, enjoying the peace and quiet.

But there is no such thing as perfect peace and quiet, not even for a short interval.

"Do you intend to lie there all evening, Boris?" asked Olga from the kitchen.

Boris turned a page. "What if I do?"

"Let's go to the pictures. Everyone's seen—"

"I can't, my dear. I'm expecting Pavel Koltukhov."

"Tonight again?"

"We have things to talk over, Olga."

News had arrived from Moscow that the experiment at the Institute of Surfaces had been successful. A stream of oil had flowed through the water of a pool three metres long. In October operations were to be shifted to the Caspian Sea, where a full-scale experiment would be mounted. The Oil Transport Research Institute was busy assembling the necessary equipment, and the power engineers had an especially large amount of work to do, under the stern, fault-finding eye of Professor Bagbanly.

Pavel Koltukhov, whose electret scheme was being applied, had now become just about the most enthusiastic champion of a pipeless oil pipeline. He spent days on end testing new samples of powerfully charged electrets.

Besides all this, a suitable area in the sea had to be found. It had to be remote enough to conceal the experiment from curious eyes. At the same time, it had to have a convenient power supply. Nikolai and Yura had been searching for just the right place along the neighbouring shore of the Caspian for more than a week now.

The doorbell rang. Her lips pressed tight, Olga went to open it.

Pavel Koltukhov entered, unbuttoning his collar and yanking off his tie on the go. As he sat down, he put a cigarette into his mouth and launched into an account of the furious argument he had just had with the head of the pipeline building organization.

"Would you like a cup of tea?" Olga asked coldly.

"With pleasure," Pavel Koltukhov replied from behind a thick cloud of tobacco smoke. "Did you hear that, Boris? 'Don't try to confuse me with

all those figures,' I told him. 'I can penetrate right into your thoughts.' Well, you should have seen the look he gave me. He asked in a frightened voice: 'Can you really?'" Pavel Koltukhov laughed boisterously.

"After what happened to Opratin no one can talk of anything except penetrability," said Privalov.

"I should think not," Olga chimed in as she poured the tea. "The whole town's talking about the ghost-man. Put aside that book, Boris, and come to the table." Then, turning to Pavel Koltukhov, she went on: "I can't understand how he made himself incorporeal. Boris says Opratin built some kind of a machine on the island. That's all very well but he didn't have any machine in the investigator's office. Or did Opratin come from the island in that—that—incorporeal state?"

"He carried an attaché case," Pavel explained, looking at the cake appreciatively. "A portable machine, evidently. It's a pity the machine was smashed when it went into the asphalt."

"He must have dropped the attaché case when the lorry hit him," said Boris. "That's why the penetrability process stopped. How is Opratin, by the way? Still unconscious?"

"Yes. He's still in a state of severe shock," said Pavel Koltukhov. "They had to amputate his whole arm, and several ribs are broken."

"It's all so frightful," exclaimed Olga. "The way Benedictov died, too. How could a photograph show his body if the body was buried in concrete?"

"That's still a mystery," said her husband. "Professor Bagbanly thinks that the matter re-

structured according to their method produced hard radiation, which acted on the film."

"It's just frightful," Olga repeated. "I can't believe that Opratin would kill anybody. Besides, in such a brutal, cold-blooded manner."

"I don't believe it either," said Pavel Koltukhov, drawing his beetling eyebrows into a frown. "I don't believe murder was committed. I know Opratin. He's a reserved man, and extremely ambitious. Not easy to get along with, perhaps, but commit a murder? No, I don't believe he did it."

"Then how do you explain Anatole Benedictov's death?" asked Boris. "It's been proved, after all, that he died before the island blew up."

"I don't know. It must have been some sort of accident. A complicated machine, restructured matter, and high voltage— With a combination like that anything could happen. Take Valery's little finger, for example."

"Benedictov couldn't have turned on the installation himself."

Pavel Koltukhov said nothing. He took another puff at his cigarette.

"Besides, look at the way Opratin behaved when the investigator was questioning him. If he were innocent, why did he lie?"

"I'd like very much to go over to the hospital and have a talk with Opratin," Koltukhov said after a pause.

"You wouldn't be permitted to see him."

"No, we wouldn't be allowed to see Opratin, of course. But I know a doctor at that hospital. We were in the same regiment during the war. I could talk to him about Opratin. Let's pay him a visit tomorrow, shall we?"

Boris Privalov and Pavel Koltukhov were not allowed to see Opratin for two reasons. First, because Opratin was in deep shock and recognized no one. Second, he was a murder suspect.

They were told all this by Pavel Koltukhov's old doctor acquaintance, an elderly, good-natured man. His hands clasped behind his back, he strode up and down his office and talked, punctuating his words with thoughtful pauses.

"It's a unique case," he said. "I haven't the faintest idea of what changes occurred in the body when the bonds of matter were altered. It's a physiological mystery, my friends. We're studying it, of course. Clinically, the picture is very involved. There have been drastic changes in the blood formula. There are other curious points. On Opratin's back, for instance, there is a dark pigmentation of a most curious geometrical pattern. We can't say whether Opratin will come out of this alive. We have managed to maintain his heart activity so far, but as to the future—" The doctor spread his arms wide. "I just don't know. He's had a fantastic shock."

When he returned home Boris Privalov sat down to work on the design of underwater radiators. Nothing seemed to be going right with his calculations. Probably because his mind was really elsewhere.

He could not stop thinking and wondering about that strange geometrical pattern on Opratin's back.

He stepped out onto the balcony into the hot, midday sunshine. Then, making up his mind, he went inside, strode over to the telephone, looked up the number of the hospital, and asked for Pavel Koltukhov's doctor friend. When the

doctor came to the phone Boris asked him to describe the design on Opratin's back in the greatest possible detail.

"Well, it consists of spots about as dark as a good suntan," the doctor said, somewhat puzzled at this request. "There are lines and zigzags against a background that looks, as a matter of fact, something like a drawing of the rising sun."

"Thank you," said Privalov. He put down the receiver and began to pace the room excitedly. Then he ran his eye across the books on his shelves. He pulled several down one after another and leafed through them. Next he rang up his wife at the library where she worked. "Are you coming home soon? When you do, please bring whatever books you have there about lightning. Yes, that's right, ordinary lightning."

Early in the evening he ran up the stairs of the house in which Pavel Koltukhov lived. Breathing heavily from the climb, he pressed the doorbell. Koltukhov was watering the flowers on his balcony. When he finally came to the door and opened it he looked at his friend in surprise.

"What's happened?" he asked with concern. "Did you ever hear, Pavel, about marks left by lightning on the body of a person who's been struck by it?"

In rare cases lightning does leave characteristic marks on the wall of a house or the body of the person it strikes. Usually the marks are a star-shaped figure with many rays; sometimes they look like a photograph of the surrounding place,

or are the imprint of an object in the person's pocket, such as a key or a coin.

It is thought that the stream of electrons and negative ions accompanying the lightning reflects objects in the vicinity in the shape of shadows.

Koltukhov listened with a doubtful expression on his face. "As far as I know," he remarked, "there has not been a single thunderstorm on the Caspian this summer. Where'd the lightning come from?"

"Remember Yura Kostyukov's photographs?" said Privalov. "Remember his description of that laboratory? It had a Van de Graaff generator, spark gaps, and a battery of electrets. The setup had an extremely high voltage, Pavel. The generator itself produced lightning—globe lightning."

"Now that's really too much, Boris. I've never heard of man-made globe lightning."

"Well, Pavel, we must see that pattern on Opratin's back for ourselves. We must obtain permission, one way or another, to visit him. Let's see whether Professor Bagbanly can help us."

The "geometrical pattern" on Opratin's back was carefully examined in the presence of the investigator in charge of the case and experts. The dark patches and lines were compared with the photographs and description of the installation. The following facts emerged.

The strange imprint on Opratin's back proved to be an outline of the cage with a human figure inside it, half buried in concrete. Moreover, a faint shadow of the coil of the "inductor of transformations" was detected, as was the clear-cut silhouette, in profile, of the control panel.

The imprint was made by globe lightning cre-

ated, probably, by a powerful self-discharge of the generator.

Just before the accident Anatole Benedictov was sitting in a chair inside the cage. The cage was not switched on. Opratin was at the hatchway with his back to the control panel, evidently about to leave the premises. In the time between the moment when the cage was switched on and the moment when Benedictov sank halfway into the concrete Opratin could not possibly have moved from the control panel to the hatchway, since penetrability occurred instantaneously.

The conclusion, confirmed by the position of the shadow of the rotary switch on the profile of the control panel, was that *the magnetic starter had been activated by the approach of the fire-ball*, which at that moment was between the panel and Opratin.

On the evening of the following day Pavel Koltukhov again sat drinking tea at the Privalovs. He was telling Olga what the committee of experts had found.

"If it had not been for the lucid mind of this old visionary," he said, nodding towards Boris Privalov, "Nikolai Opratin would still be facing the charge of a horrible murder."

"Opratin lied to the investigator only because—"

"He was afraid he wouldn't be believed," said Koltukhov. "He had no idea he was carrying the proof of his innocence on his own back."

"Have you shown Professor Bagbanly the latest calculations?" asked Boris, switching the conversation to current matters.

"Yes. It's a pity you didn't go along with me

today to see him. He called a team of experts together to throw light on that horoscope."

"What for?"

"That's just what I said too. 'Why are you going in for all that mumbo-jumbo?' I asked him. 'It's interesting,' he said. 'We had a historian here, and he gave an ingenious interpretation of the horoscope.'"

"Indeed?"

"Yes, and it turns out the horoscope was drawn up for a very specific reason."

The End of the Story of the Three Boxes

As the sound of horse's hooves died away Count Joseph de Maistre fell back into his armchair. His lean fingers dug so deeply into the arm rests that his hands began to ache. He felt a sharp pain in his chest and, with a groan, he closed his eyes. When the pain subsided he summoned his servant and ordered him to trim the candles and bring coffee.

Should he send someone in pursuit? No, there was no sense in that. The arrogant Russian was by now far away. The Lord would punish him.

He would write to faithful servants of the Society of Jesus in Russia. They would keep an eye on Arseny Matveyev; that freethinker would not escape retribution.

The key to the mystery was the main thing, and it was in his hands. The Count picked up the parchment from the table and glanced at the drawing showing the relative positions of the planets and the signs of the zodiac. The fruit of the astrologist's labours aroused his deepest respect. Exactly one hundred years after the

magic knife fell into his, Joseph de Maistre's, hands, a man would be born who would learn the secret of the knife and bring new glory to the Jesuits. The power of the Society would become truly boundless, and this, as God knew, was the Count's sole desire.

The old Count slowly folded the parchment and hid it in the flat iron box with the letters *A M D G* engraved on the lid.

Count de Maistre's last will and testament was not forgotten. One hundred years later Jesuit priests chose a new-born child according to the signs in the horoscope, and persuaded its parents to entrust the child's education to a Jesuit college.

Vittorio da Castiglione developed into a clever but reserved boy. His eyes gazed out on the turbulent world beyond the college walls with a cold weariness that had nothing childish about it.

When Vittorio reached the age of twenty-one he was told, in the course of a solemn ceremony arranged in sombre surroundings, about the lofty mission planned for him more than a century before. The young Jesuit learned how the illustrious Count de Maistre had concerned himself about the future greatness of the Society, how a free-thinking Russian had stolen a secret manuscript and a magic knife from him. Now he, Vittorio, must find and return to the Society the source and evidence of the great mystery, so that they could be passed on to the finest minds of the Catholic world, *ad majorem Dei gloriam*, for the greater glory of God.

Vittorio was told all about the Matveyev family, all the details which the Society had so painstakingly collected and recorded on the other side of the horoscope. He hung the small

flat box, with the parchment inside it, round his neck, along with his tiny gold crucifix, knelt, and vowed solemnly that he would carry out his mission.

Vittorio da Castiglione trained for it diligently. He learned Russian and studied navigation at a school for submarine officers in Livorno. When Hitler's divisions, followed by those of Mussolini, moved against Russia the young submarine officer set out for the Russian battlefront in the Tenth Flotilla.

At the end of August 1942, after spending some time in Sevastopol and Mariupol, Vittorio parachuted from a Junkers plane into the misty night of a mountainous area near Derbent. There, on the shore of the Caspian Sea, he was to select a base for his flotilla. Afterwards he was to make his way south, to a large coastal town, with an important subversive assignment. According to his information, the descendants of Fedor Matveyev lived there. Their names were firmly fixed in his memory.

His hour of greatness was approaching.

In the deserted stone quarries near Derbent, the ancient city of the Iron Gates, Vittorio sought a secluded spot where he could conceal his radio transmitter, aqualung and other paraphernalia for the time being. Suddenly the earth gave way beneath his feet and he fell into a pit and was crushed, and killed, by a heavy rock.

And so Vittorio da Castiglione, twenty-seven years old, a minion of the Jesuits, perished, to the greater glory of God.

It was very early in the morning when Nikolai and Yura returned to town by bus from their

latest trip. They agreed to meet at the Institute an hour later, after a shower and breakfast.

Cooper Lane was still asleep. The morning breeze whispered shyly in the dusty branches of the acacias. The ringing of an alarm clock came through an open window.

Nikolai walked under the archway leading into the courtyard. Inside the yard he saw Bugrov at his morning exercises. Holding large dumb-bells, he was doing slow knee-bends. When he saw Nikolai he winked at him, then gestured for him to come closer.

"There was a meeting at the Institute day before yesterday," he said in a loud whisper. "The Institute is going to vouch for me. See?"

"No, I don't."

"You don't think quick, do you? I suppose you didn't get enough sleep last night. Anyway, remember that small piece of iron I pinched from a museum in Moscow?"

Nikolai nodded.

"Well, they wanted to put me on trial for it. But would that be fair? I didn't take it for myself. I need it like a turkey needs a walking stick. Anyway, a general meeting at the Institute said it would help me out by vouching for me. The vote in favour was unanimous."

"Congratulations," said Nikolai.

"Thanks." Bugrov tossed the dumb-bells into the air and caught them. "Did you hear about Opratin? He's been cleared of the murder charge."

"Is that so?"

"That's right. You know who killed Anatole Benedictov? A fire-ball."

"A fire-ball?"

"That's what I'm telling you. A scientific phenomenon, see?".

Nikolai waved his hand impatiently and ran up the steps to his flat. After he had showered his mother told him the current domestic news while she prepared his breakfast.

All of a sudden she stopped short. "Oh, I quite forgot to tell you. Rita dropped in last night."

"Did she say why?" he asked quietly.

"No, but she asked me to tell you to ring her up as soon as you returned."

Nikolai hurriedly finished dressing and dashed to the telephone.

* * *

Although the term had not yet begun—it was only the middle of August—Rita went to school every day. She was re-equipping the biology lab and planned to enlarge the experiment plot on which the children gardened.

All this activity was her salvation.

Val often dropped in to see her in the evening. Nikolai and Yura had visited her several times. Once the entire crew of the *Mekong* gathered at her flat in the evening. Valery Gorbachevsky was the hero of the occasion. He had brought a copy of a scientific journal in which Professor Bagbanly described the restructuring of the internal bonds of matter. The article spoke of the "Gorbachevsky effect", as the professor called the memorable accident involving Valery's little finger.

His face glowing, Valery showed the article to Rita. She did not understand anything, naturally, since the article consisted mostly of formulas and charts, but she congratulated Vale-

ry, who did not understand the article either. Yura insisted that a mould of Valery's finger, if not the finger itself, would soon be on display at the Economic Achievements Exhibition in Moscow.

But when Rita was all by herself her grief prevented her from settling down to anything. She would wander through the rooms of the flat, touching and moving objects to no purpose. She would stand for a long time in front of the bookcases, leafing through Anatole's books. When she came across marginal notes in his hand she studied them intently, trying to guess the meaning of the underlined words and symbols.

One day Rita came upon a notebook with a blue oilcloth cover that stood between two thick volumes. She looked through it. Scattered among memoranda were notes on how experiments were going, formulas and diagrams. There were other entries, too, the kind that are made only in diaries.

Lying curled up in a corner of the sofa, Rita read and reread the notebook. At last she could no longer contain herself and burst into tears.

In the morning she telephoned Yura and was told that he had left town on an assignment. She went to school and worked on the experiment plot until evening. Then, in the hot, thronged streets, she suddenly realized that she simply could not go back to her empty flat.

Rita went to Cooper Lane. She stopped in the familiar courtyard and stared at it, her soul a tumult of anguished feeling. How small and old it was, this courtyard of her childhood.

Slowly, as though in a dream, Rita climbed the stairs to the second floor. A middle-aged wo-

man with a kind, familiar face opened the door.

"How do you do?" said Rita. "Don't you remember me? I used to live in this house. My name is Rita."

"My goodness, little Rita. I would never have recognized you. Do come in. What a pity Nikolai has left town for several days."

"Has he left town too?"

Nikolai's mother insisted that Rita stay for a cup of tea. As Rita drank her tea she kept glancing at a big photograph on the wall, of an unsmiling lad with a forelock, in a white shirt with sleeves rolled high. This was the Nikolai she had known when they were children.

Rita stayed at Nikolai's house until late in the evening. It was soothing to listen to his mother talk.

"Thank you," she said in a low voice as she took her leave.

"For what?" Nikolai's mother asked in surprise.

The bell. Who could it be so early in the morning? Rita hurried out of the bathroom to the telephone.

"Excuse me for ringing so early," said a familiar voice, "I just arrived back in town and Mother told me—"

"That's quite all right, Nikolai. I'm an early riser. I must see you."

They met at the bus stop near Rita's school.

"Has anything happened?" Nikolai asked anxiously, with a searching look at Rita's face.

"I found a notebook of Anatole's. His notes on what he was doing. There's much of it I don't understand. May be you could use the

notes." She drew the notebook in the blue cover out of her bag. "Take it, please, and read it. You may pass it on to Privalov, or to the Moscow Academician to whom you sent the knife."

"Very well, Rita. I'll read it today."

"There's something else." Rita lowered her voice and closed her eyes for a second. "Nasty rumours are being spread about Anatole. Nikolai, you must help me to clear his name. Help me to make the truth known."

"If only you had allowed me to do that before," Nikolai thought. "If only you had not made me promise, in the train—"

"Very well, Rita, I'll do everything I can," he said.

She pressed his hand. "Now go. But don't disappear for long. Ring me up."

That afternoon Yura and Nikolai stepped aboard an Institute launch and set out for Bird Rock, a small island seven kilometres from shore.

The island was as flat and round as a dinner plate. A black rock washed smooth by the tide rose on the weather side. Seagulls nested on this rock, and it was after them that the island had been named.

Our friends measured off an area for future structures, a job which took them until evening. The launch was due to return for them only the following day. They pitched their tent, lighted their primus stove, and prepared a meal. Then Nikolai pulled the notebook in the blue oilcloth cover out of his knapsack, and he and Yura lay down side by side on the sand to read it.

CHAPTER NINE

IN WHICH, THE BOOK ENDS, BUT WITH THE PROMISE OF NEW THINGS TO COME

The full-scale experiment in pipeless oil delivery was to be mounted between the shore and Bird Rock, seven kilometres away. The seabed at both terminals of the route had been deepened. Steel pylons had been set up in the water for the transmission and reception radiators.

A conventional pipeline along the coast ran to the dispatching station. Here, making a sharp dip, it dropped straight down into the sea along the pylon. At a depth of twenty metres it ended in a plastic elbow bend with a wide funnel facing seawards. Two large, well-insulated Möbius bands had been mounted, one in front of the other, inside the funnel. Behind the elbow bend, in a pressurized chamber stood a generator of original design connected with a circular screen aerial surrounding the funnel. Thick cables ran from the Möbius bands and the generator to panels of the shore station, which had a complex array of electronic control equipment.

Similar equipment had been set up on Bird Rock. The shore funnel and the Bird Rock funnel were situated exactly on the same axis. Setting up the two pipes directly in line with each other across a stretch of seven kilometres of sea had called for the greatest precision. Geodesists and divers had had to work hard to attain the desired precision.

The idea of the project was as follows: the coastal pipeline would carry the oil into the sea, to a depth of twenty metres. As it came out of

the funnel the stream of oil would flow through the field of the first Möbius band and acquire penetrability. The field of the second Möbius band would compress the surface of the stream and give it an exact shape. The underwater circular aerial would create an energy beam between the shore and Bird Rock. The static field would force the stream of oil to flow through the water along this beam. As it passed through the field of the receiving Möbius band at Bird Rock the stream of oil would regain its normal properties. After entering the reception funnel it would be pumped to a storage tank.

In the last stage of the preparations Yura and Nikolai, who had been put in charge of the reception station, with Valery Gorbachevsky as their assistant, spent several days and nights at Bird Rock.

Finally the apparatus was assembled and the assemblymen departed from Bird Rock for the mainland, leaving behind only an engineer and a radio operator.

The cars sped along the coastal highway, ran through a small community buried in the greenery of vineyards, then turned off onto a dirt road that took them to the beach. They came to a stop beside a board fence in the shade of a cluster of old mulberry trees.

The members of the experiment team were gathered there, as well as quite a crowd of people from the Oil Transport Research Institute and other research institutions. Academician Georgi Markov was there; he had flown in from Moscow the day before especially for the occasion.

Several launches were tying up at the pier. One of them discharged a thickset man with a head of curly greying hair. He was followed by a solemn, dignified Vova Bugrov carrying a small suitcase.

Academician Markov shook hands warmly with the grey-haired man and led him over to Boris Privalov.

"Do you know each other?" he asked. "Jafar Rustamov is director of the Marine Physics Institute."

"We've met before," smiled Boris Privalov. "Jafar's institute is across the street from ours."

"You two can look forward to a great deal of joint work," said Academician Markov.

Privalov gave him a questioning glance, but the Academician had turned to Professor Bagbanly. Rustamov smiled to himself; he already knew what the Academician from Moscow had in mind.

Bugrov nodded loftily to Nikolai and Yura.

"Hullo there, boys," he said. "I'm surprised to see you here."

"We're surprised to see *you* here," said Nikolai.

"I was invited," Bugrov replied, squinting against the sun. "I was asked to come together with our director. I'm in charge of underwater affairs."

Everyone went into the building that housed the chief control desk. The desk was composed of three panels: one for the generator of penetrability, which was connected with the Möbius bands at the underwater funnel; one for the pumps that drove the oil into the funnel, and one for the energy beam.

Electricians were working at the third panel, ironing out a hitch. Although the generators hummed, the needle on the field-intensity meter stood at zero. Boris Privalov impatiently tapped the glass of the meter.

"What's the matter?" Academician Markov asked sharply.

"I can't understand it," Privalov muttered. "Everything was all right yesterday."

"Get in touch with Bird Rock."

A few minutes later the radio operator told them: "Bird Rock reports that the indicating light is out."

"Evidently the funnel was not attached tightly enough, and the current pushed it out of line," said Pavel Koltukhov. "The beam doesn't reach the aerial on Bird Rock because the axis of the underwater funnels has shifted."

"You should have done a line-up from the surface," Academician Markov said. "Use your divers."

"I have a suggestion, Professor," said Jafar Rustamov. "I have a man who can do the job. I should also like him to film the start of the operation, if you don't mind."

"Where's your diver?" asked Academician Markov.

Bugrov stepped forward, coughing modestly behind his hand. The Academician looked him up and down.

"He'll smash the installation," said Professor Bagbanly. "Just look at those huge fists."

"Let me go down together with him," said Nikolai, coming forward. "I'll show him the spot and help him to—"

"What an idea—after a bout of pneumonia!" Yura exclaimed. "I'll do the diving."

"Very well. Only be quick about it."

Bugrov clapped Yura on the shoulder. "Let's go," he said.

They changed into their swimming trunks and went out to the little steel bridge connecting the shore with the pylon down which the pipeline ran into the sea.

Nikolai helped them to put on the aqualungs. A wrench was tied to Yura's wrist, and a signal rope was looped round his waist. He and Nikolai agreed on the signals they would use.

After pulling on his mask and switching on the cylinder, Yura slid into the sea. Bugrov plopped into the water in his wake.

They descended slowly through the cold green semi-darkness alongside the steel sections of the pylon.

When the pressure-gauge showed they were at a depth of twenty metres Yura saw an elbow with a wide funnel at its end. It held the Möbius bands and the aerial of the radiator.

Yura waved to Bugrov and crawled inside the pylon. He loosened the elbow with his wrench, and then Bugrov cautiously turned the funnel in the stiff joint. This was by no means easy to do. The current pressed Bugrov up against the pylon; he moved his flippers, seeking a support for his feet. Yura gestured to indicate that he should turn the funnel a little more to the left, but less energetically.

Suddenly there were two vigorous tugs on the signal rope. Nikolai was telling Yura that the beam had reached Bird Rock, which meant the axes of the funnels were in line. Yura imme-

diately gestured to Bugrov, then started locking the nuts one after another. After he finished Bugrov took the wrench and gave the nuts a final twist. Watching Bugrov's shoulder muscles bulge Yura was certain no current would ever move the funnels out of line again.

He tugged on his rope three times to say that everything was all right. The Möbius bands could be fed and the pumps switched on. Then he wrapped his arms and legs round the steel crossbars of the pylon and waited. Bugrov did the same nearby. He untied the cine camera from around his waist and trained it on the funnel.

A long minute passed before the pylon began to vibrate. There was a vague rumble overhead as the pump was switched on and it started to force oil down the pipe, driving out the water.

All of a sudden a dark stream the thickness of a human body poured out of the funnel, as though an invisible man were slowly pulling a big log out of the elbow of the pipe. The log grew longer and longer.

A stream of oil fourteen inches in diameter was flowing through the water. It flowed evenly and compactly with a clearly defined surface that was surrounded by a faint violet glow.

A stream of oil flowing through the sea was no longer a dream, no longer a remote vision! It was a man-made miracle!

Yura felt like shouting, turning somersaults, laughing. He waved to Bugrov, but Bugrov was busy filming the stream.

With four tugs on the signal rope Yura let Nikolai know that the stream of oil was flowing. An answer came at once; his signal was understood. Yura untied the rope round his waist and

pushed off from the pylon and began to swim alongside the stream of oil.

It was easy to keep up with the stream, for the installation was not functioning at full capacity. The stream of oil was moving at a speed of no more than one metre per second. When the transcaspian pipeline went into operation the speed could be greatly increased, for the stream cut through the water easily, without meeting resistance.

Yura, eager to rejoin the others on shore, gestured to Bugrov. Working their flippers slowly, the two men swam to the surface.

Nikolai waved to them from the bridge and shouted something, his face shining with excitement.

The committee that was to approve the pipeline travelled out to Bird Rock on a big white launch. There was plenty of time; the stream of oil would reach the island only two and a half hours later.

Alarmed seagulls circled above the black rock, human beings had given them no peace for the past few weeks.

The committee members stepped out of the launch onto the sandy shore of the island and unhurriedly inspected the open steel tank. They did not all believe the tank would be filled with oil that had flowed, without a pipe to contain it, through seven kilometres of sea. They listened closely to engineer Yura Kostyukov, who told them again and again how he had seen a stream of oil emerging from the funnel.

When only a few minutes were left to the

scheduled time Academician Markov ordered the pump switched on. A stream of foaming water rushed into the tank. There was no oil as yet. The pump had to be turned off.

Yura could not hold back his impatience. He silently stripped to his swimming trunks, heaved the aqualung cylinders on his back, pulled on his mask, and dived into the water. Bugrov also put on an aqualung and dived in.

Yura saw the stream of oil almost at once. It was moving towards him, with a dark, snub-nosed end that looked like a gun muzzle. As before, it was surrounded by a faint violet glow.

The strange sight filled Yura with awe. He pushed himself upwards so fast that his eardrums began to ache, and he slowed his rate of rise. He broke the glassy surface of the sea to return to a world of bright sunshine. Yanking out his mouthpiece, Yura shouted to the people on the shore:

"It's here! Switch on the pump!"

Hastily gripping the mouthpiece between his teeth again he dived and swam over to the pylon, where Bugrov sat with his camera.

They saw the stream of oil pass through the Möbius band, after which it was neatly drawn into the broad funnel.

Members of the experiment team crowded about the platform at the top of the tank. So far, the pump was bringing up foamy water. Suddenly the water darkened. Scattering an iridescent spray, a dark-brown stream of oil splashed into the bottom of the tank.

Pavel Kolchukhov, who stood closest to the stream, put a finger into it. Yes, it was oil, oil that had been sent across seven kilometres of

sea without a pipe, in an "incorporeal", restructured state, easily piercing the water. Now it was passing through the field of the receiving Möbius band and again becoming tangible and "normal".

Professor Bagbanly drew Boris Privalov to him and embraced him. "My heartiest congratulations, Boris," he said.

"I congratulate you too," said Boris Privalov, his voice hoarse from excitement and happiness.

The committee went down to the launch and returned to the mainland. Now the experiment was repeated in reverse. This time the stream of oil flowed just as obediently from Bird Rock to the tank on shore.

"The experiment has been very satisfactory," said Academician Markov. "Be sure to collect the tapes from all the recording instruments. This will be enough for today."

"Is that all he could tell us—that this is enough for today?" Privalov thought. "As though it weren't a day of a miracle? But I suppose big scientists think along different lines than the rest of us do. To them today's experiment is just one among a great many others."

Meanwhile the group was beginning to disperse. Jafar Rustamov was about to leave too, but Academician Markov detained him. "Please don't hurry away, Jafar," he said. "I want to talk to you."

Academician Markov, Professor Bagbanly, Boris Privalov, Pavel Koltukhov, Jafar Rustamov and Nikolai and Yura were now the only ones left in the control-desk building. They sat in front of the white panels. Outside, the leaves on the old mulberry trees rustled in the breeze.

Every once in a while a yellow leaf drifted into the room through an open window and slowly sank to the floor.

"Let's sum up," said the Academician. "We've ripped off the surface of matter and restructured the internal bonds of matter. The impenetrable has become penetrable.

"The Möbius band, a generator built in Boris Privalov's laboratory, and the field frequency characteristics found at the Institute of Surfaces all contributed to the success of this experiment. A highly interesting question still has to be investigated, and that is the interaction between penetrability and the earth's field of gravitation. Our laboratory has thoroughly analysed the band that was engulfed by the block of concrete. From Benedictov's notebook we know that their 'concrete floor 'swallowed up' restructured matter. There is also Benedictov's tragic death." The Academician spread his hands.

No one said anything for a few moments. Boris Privalov broke the silence. "How, Academician Markov, do you explain the fact that in some cases the object which acquires penetrability remains above the surface of the ground or the floor, and in other cases it drops through this surface?"

"So far, I think it goes something like this. Restructured matter, like ordinary matter, possesses mass and hence gravitates towards the centre of the earth. But if an obstacle of ordinary matter, say, a floor, the seat of a chair, or the surface of the earth itself, appears in the gravitational path, then the obstacle acts as a 'damper of gravity'. The property of penetrability manifests itself in all directions except the

strictly vertical. But under certain conditions the 'field of transformation' and the field of gravitation may interact in such a way that the 'damper effect' shifts downwards vertically. Then we get the 'sinking'."

"We must co-ordinate the parameters of the installation with the force of gravity in the given geographical area," said Professor Bagbanly. "Preliminary gravimetric measurements are essential."

"I agree with you, Professor. Incidentally, allow me to congratulate you on your energy scheme. It stood the test splendidly."

"I appreciate your kind words," Professor Bagbanly said, laying his hand on his heart. "But a new scheme will be needed for a route across the entire Caspian, and for long distances in general. Don't forget that we'll have to bend the beam to make it conform to the curvature of the earth. I couldn't do that by myself even if I were to lean all my weight on the other end of the beam."

Academician Markov gave Professor Bagbanly a friendly pat on the shoulder.

"We'll all lean on your beam together," he said with a laugh. "That way we may succeed in bending it. Koltukhov's electrets are of fundamental importance. They provided an inexhaustible source of current and thus prevented the possibility of a power failure."

"Nikolai Opratin had a battery of electrets on his island," Yura put in.

"There it was being used for a different purpose, to transfer the properties of the knife to other objects," said Professor Bagbanly.

"You mentioned the notebook that belonged

to the late Anatole Benedictov, didn't you?" Privalov asked, turning to the Academician. "Suppose we were to reproduce his 'transmission installation'? It seems to me that would make the work easier."

"It certainly would," said the Academician. "Benedictov really did a brilliant piece of research. Opratin apparently played a most significant role too. Do you remember my saying last spring that I thought it might be possible to transfer the properties of an object with restructured bonds to other objects? Benedictov did just that. The unknown Indian scholar may have worked along the same lines.

"But Benedictov failed to achieve stability. It's a great pity, a very great pity, he did not work in contact with us. There are many interesting points in his records. By the way, I am urging the Academy of Sciences to publish his papers."

"That's splendid!" Nikolai exclaimed.

"Now," said Academician Markov, "I want to hear what our friend Jafar Rustamov has to say."

The director of the Institute of Marine Physics passed a hand over his curly hair, coughed, and began:

"The problem of raising the level of the Caspian—"

"Look here, my son," said Professor Bagbanly. "I know how good you are at making speeches. But don't make one now. Just give us the gist of it. We know all about the problem."

"I should say we do," said Pavel Koltukhov. "We know all about water heaters on the Black Sea, a cloud conductor across the Caucasian

mountain range and man-made cloudbursts—"

Rustamov nodded. "Very well, to put it briefly, Nature uses up millions of kilowatthours of solar energy to produce a few average-sized clouds in the second half of a summer day. You know that, of course." His eyes crinkled in a sly smile.

"Yes, certainly," said Koltukhov in a voice that was not quite certain.

"Fine. Now we have nuclear power, a tremendous source of energy. The only drawback, my friends, is its cost. A long man-made downpour is an extremely expensive business. We have done preparatory research anyway, because any expenditure would be justified if we succeeded in raising the level of the Caspian. This summer we lost our experimental condenser installation on Ipaty Island. But you all know that. Now Academician Markov has suggested something else. Instead of shifting clouds from the Black Sea to the Caspian he proposes building an underground sea-water line beneath the Caucasian isthmus."

"A sea-water line?" Privalov repeated, slowly rising from his chair.

The young engineers jumped to their feet and stared at Rustamov in astonishment.

"Yes, a sea-water line," said Academician Markov. "At approximately the 42nd parallel, between Poti on the Black Sea and Derbent on the Caspian Sea. Today we sent a stream of oil through the sea. Tomorrow a sea-water line could carry a stream of Black Sea water through the ground into the Caspian."

A stunned silence reigned in the room for a moment. The engineers were struck dumb by the scope of the idea.

"I've already calculated that it would be much cheaper than anything else," Rustamov went on briskly. "I was doubtful about it at the beginning, but now I see how it can be done. It's a good idea."

"Good?" shouted Privalov. "You say it's a good idea? I call it fabulous."

"Don't get excited, Boris," said the Academician. "The idea of a sea-water line cannot be compared in scope with all the prospects which penetrability holds out to us. The future will produce a great deal that is amazing and surprising. I can tell you one thing. Our Institute is doing highly promising experiments in releasing the energy of surfaces."

Nikolai and Yura, standing by the window, were excitedly discussing something.

"They're already planning the details of the scheme," said Koltushov, nodding in their direction. "See that wild gleam in their eyes?"

Outside, twilight was falling; silvery stellar dust powdered the sky.

The launch sped along, cutting diagonally across the path of moonlight on the water. The passengers sat in silence, weary after the long, fruitful, and fascinating day.

They were racing ahead towards the lights of the big city. The channel buoys cheerfully blinked their red and yellow lights.

"Do you remember how it all began, Boris?" Nikolai suddenly asked.

"How *what* began?"

"Well, the experiments with surface tension and the rest of it."

Boris Privalov paused for a moment. "Actually, how *did* it all begin? I recall there was some

talk about it while we were out sailing one day."

"But before that, don't you remember the bazaar? We were standing in front of that painting of Leda and the Swan, and you said—"

Boris Privalov laughed. "Ah, to be sure. You're right. That vulgar painting was what gave us the idea—"

He turned to Academician Markov to tell him how it had all begun at the bazaar. The Academician laughed, then said, his face serious, "That painting was just an accidental factor. The important thing is—" He could have carried on from there at length, but instead he limited himself to giving Boris's arm a friendly squeeze.

A big white ship, all gleaming with lights, cut across the path of the launch. Dance music came from the open portholes of the saloon.

Yura turned to read the name on the high bow of the ship.

"The *Uzbekistan*," he said. "Look, Nicky, it's the *Uzbekistan*!"

Nikolai did not answer. He stood there gazing after the ship for a long time.

EPILOGUE

One evening in early winter when snowflakes were floating lazily earthwards, only to melt at once on the wet black pavement, Rita sat curled up in her favourite spot on the sofa, leafing through a thin paperback.

She studied the lines of familiar and unfamiliar formulas and carefully read the description of experiments, for she well remembered some of

the early ones. Again she looked at the cover. At the top was the author's name: *Anatole Benedictov*, and below it, the title: *Changing the Internal Bonds of Matter.*

The book had just arrived from Moscow that morning. It had not come out in a large printing, for it was intended for a narrow circle of researchers. Academician Markov was the editor and also the author of the introductory essay and the commentaries.

The room was quiet. Rita lifted her head to look about her, at the standing lamp, the fish in the aquarium, a solitary microscope on the desk. Then she looked at the cover of the book again, and at the author's name: Anatole Benedictov.

The doorbell rang. Rita sprang up and ran out into the entryway, straightening her housecoat on the way. No one had rung her bell for a long time.

Pronka, the black cat, was at her side as she opened the door. When she saw it was Val and Yura her face lit up. Behind them Rex moved impatiently, his paws tapping on the floor.

"How glad I am to see you!" Rita exclaimed, shaking hands with her visitors.

She was about to pat Rex on the head when he suddenly gave a jerk, pulling the leash out of Yura's hand, and raced into the depths of the flat, barking wildly. They could hear chairs being knocked over.

"That dog will be the death of me," Val complained.

Hurrying into the dining-room, they found Pronka on top of the sideboard, her fur on end, hissing furiously. Rex kept leaping frantically

into the air in a vain attempt to get his teeth into his age-old enemy.

"Down, Rex, down!" Yura shouted sternly, seizing Rex by the collar. "Where are your manners, sir?"

Rita picked up Pronka and carried her into the kitchen, the door of which she carefully closed. Rex wagged his stub of a tail guiltily. Order was restored.

"You look splendid, Val," Rita said. "Marriage certainly seems to agree with you."

The reader will forgive the authors for failing to describe the wedding of Val and Yura. They will merely note that it was a very gay wedding indeed, and that the crew of the *Mekong* was there in full force. Valery drank a bit too much and then went on to give a display of the latest dance steps, followed by a moving rendition of an old Papuan song, to the delight of all present at this most delightful wedding.)

"I'm surprised to hear you find me looking well," Val said. "It's taking all my patience to get along with this brute."

"Why aren't you treating your wife properly, Yura?" Rita asked.

"Nobody is mistreating her," Yura replied from the armchair in which he had settled himself. "You know, she gave me her thesis to read—"

"Just imagine," Val interrupted. "I'm going to present it soon, so I wanted his opinion. Well, I gave it to him to read, and he—"

"Tore it up?" Rita asked in mock horror.

"Worse than that. He read it aloud, making snide remarks as he went along. You know the sort of things Yura is capable of saying."

Rita laughed. "How glad I am to see you!"

she said again, feeling a surge of affection for the young couple. "I'm going to serve you tea now."

Yura was on his feet instantly. He took Rita by the arm. "Let's not have any tea this time, really. We dropped in to pick you up and take you to Nikolai's with us."

Rita gave Yura a long look. "What for?"

"No special purpose. Just a friendly call. Nikolai has always been a stay-at-home, and now more so than ever before. He's permanently in low spirits and sits at home all the time. He doesn't even want to go to the pictures. I have to drag him out. Let's go over and cheer him up."

Rita said nothing for a moment. "Very well," she consented.

The snowflakes that were floating down to the wet pavement melted immediately. But there was snow clinging to the garden fence in a thin, fragile layer. Yura scooped some of it into a snowball and aimed it at Val.

"Don't you dare, you beast!" she cried, taking shelter behind Rita. She was wearing a new coat.

Yura tossed the snowball at Rex. Rex was wearing his old coat of beautiful striped fur and was not at all afraid of ruining it. He yelped with joy.

They came to the house in Cooper Lane, entered the yard and climbed the steps to the second floor. Yura pushed the bell. The door opened—

TO THE READER

MIR PUBLISHERS would be grateful for your comments on the contents, translation and design of this book. We would also be pleased to receive any other suggestions you may wish to make.

Our address is:
USSR, 129820, Moscow I-110, GSP
Pervy Rizhsky Pereulok, 2
MIR PUBLISHERS

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EVGENY VOISKUNSKY was born in Baku, Azerbaijan, in 1922. After finishing secondary school he went to Leningrad to study the history of art. The Second World War interrutped his studies. He served in the Baltic Fleet, taking part in the defence of Hanko Island and Leningrad. For many years after the war he worked for the newspaper published by the Navy. His first novels were about men serving in the Soviet Navy. *The Crew of the Mekong* is the first of the science-fiction novels written in collaboration with I. Lukodyanov.

ISAI LUKODYANOV (born 1913) was an engineer at a machine-building works and served in the Air Force during the Second World War. Then he returned to Baku and became a design engineer. He is the author of several technical books. In recent years he has written science-fiction stories and novels together with E. Voiskunsky.

These two well-known writers of science fiction followed up *The Crew of the Mekong* with the novel *The Black Pillar*, a collection of short stories called *At the Crossroads of Time*, the novel *Very Distant Tartess* and the novel *The Gentle Splash of Stellar Seas.*

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